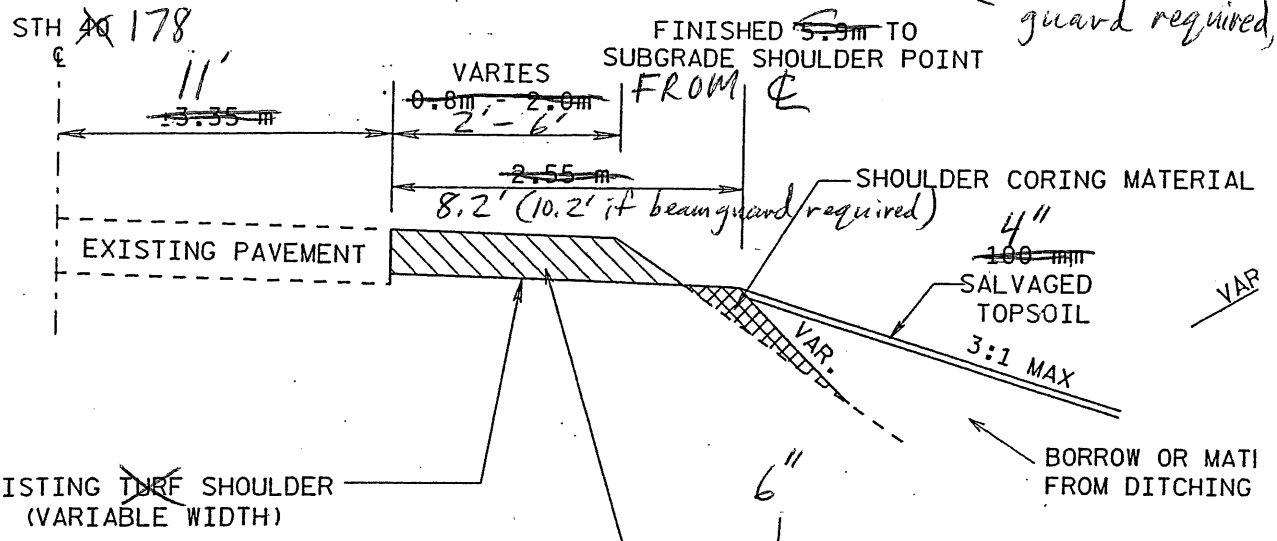
SHOULDER CORING DETAIL

~~STA. 10+000 TO 22+245~~

19.2' (21.2' if beam-guard required)



REMOVE SHOULDER TO A DEPTH OF ~~150 mm~~ WHERE REQUIRED. EXCAVATED MATERIAL WILL BE USED TO WIDEN ADDITI SLOPE. ADDITIONAL MATERIAL SHALL BE F FOR AS COMMON EXCAVATION FROM GRADING AREAS OR BORROW EXCAVATION.

NOTE: THIS OPERATION MUST BE COMPLETED PRIOR TO THE MILL & RELAY OPERATION.

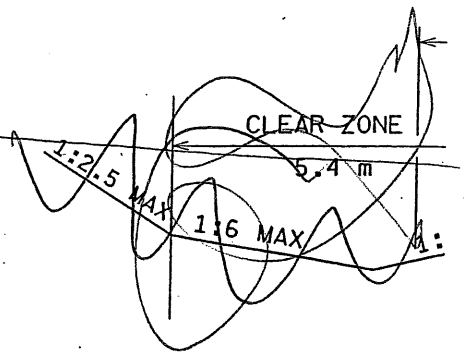
NOTE:

IN AREAS SPECIFIED IN THE MISCELLANEOUS QUANTITIES AND AT THE DIRECTION OF THE PROJECT ENGINEER, CRUSHED AGGREGATE BASE COURSE SHALL BE PLACED ON THE PAVEMENT JUST PRIOR TO THE MILL AND RELAY OPERATION TO HELP ADJUST PROFILE IRREGULARITIES.

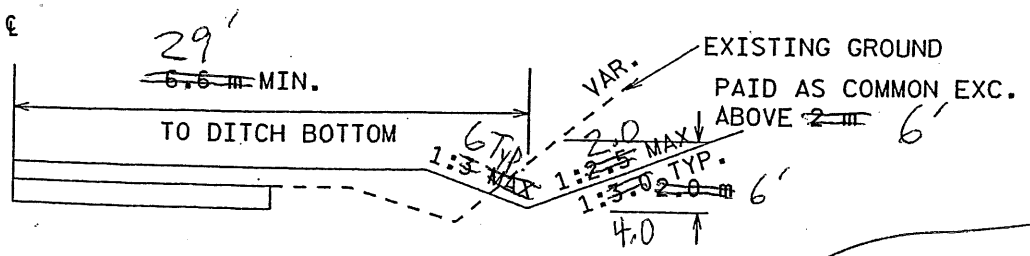
~~SBE~~

794 - 796 Rt. ✓
799 - 802 Rt. ✓
805 - ~~8~~06 Rt. ✓
809 - 810 Rt. ✓
814 - 821 Rt. ✓
911 Rt. ✓
947 Rt. ✓
1035 - 1039 Rt. ✓
1102 - 1103 Rt. ✓
1110 Rt. ✓
810 Lt. ✓
816 - 817 Lt. ✓
889 - 890 Lt. ✓
999 Lt. ✓
1048 - 1050 Rt. ✓
1056 - 1060 Rt. ✓

791 Lt.
797 Lt.
905 - 906 Lt.
911 - 913 Lt.
949 - 956 Lt.
959 - 961 Lt.
963 - 969 Lt.
1075 - 1083 Lt.
1089 - 1107 Lt.



DITCHING ~~TYPICAL~~ DETAIL



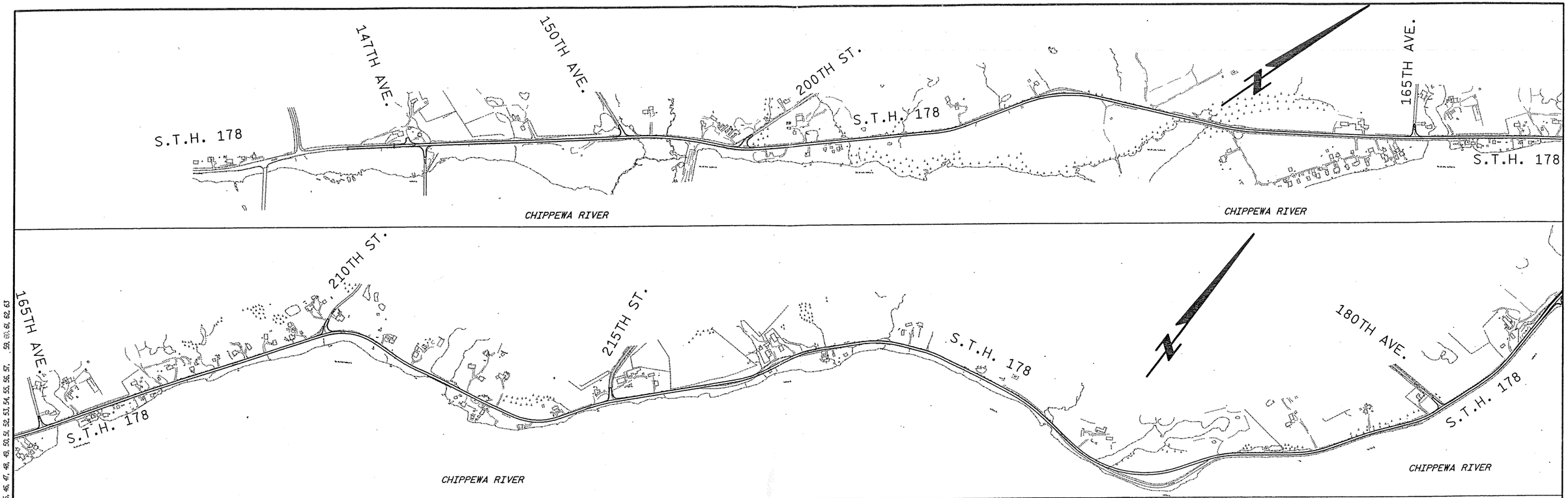
NOTE: INSLOPES AND BACKSLOPES MAYBE ADJUSTED BY PROJECT ENGINEER.

From Project 8580-00-70

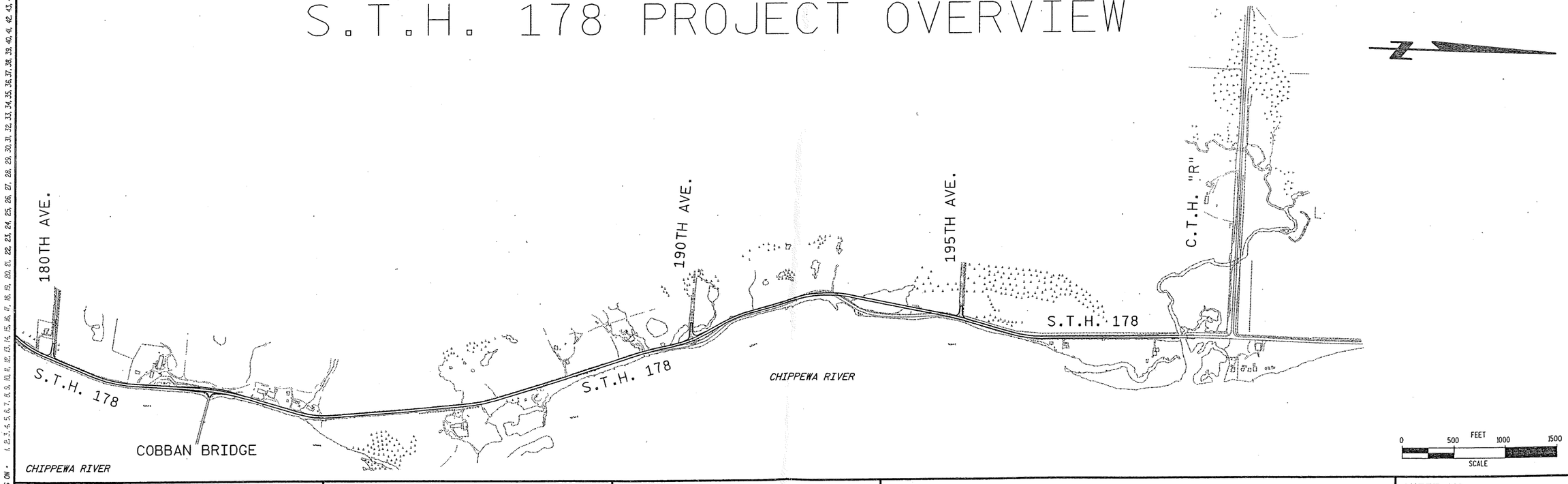
TYPICAL SECTIONS - S.T.H. 40 | SCALE: 1: | HWY: S.T.H. 40

FILE NAME: D6 85800000:8580TYP.DGN | REV. DATE: 09-25-00 JDB | PLOT NAME: 8580TYPld.l

LEVELS ON - 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63

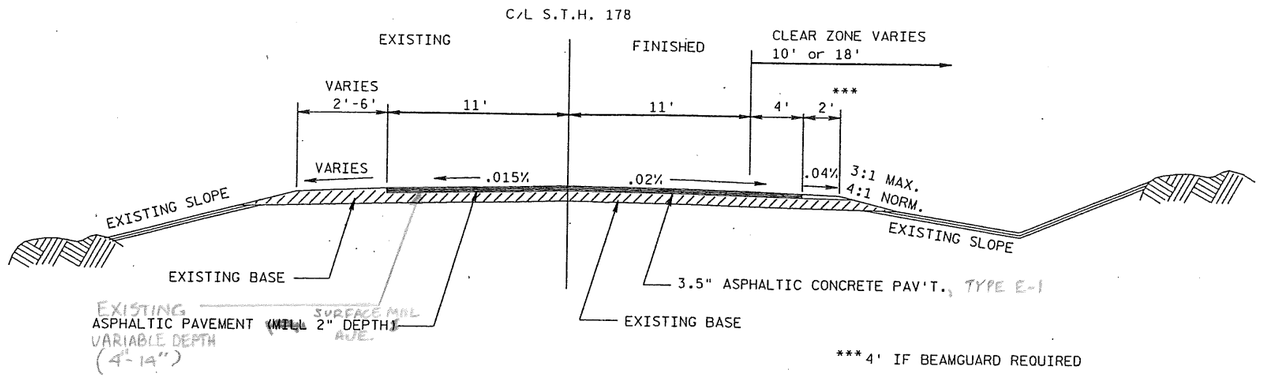


S.T.H. 178 PROJECT OVERVIEW



STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN	SHEET NO: .	E

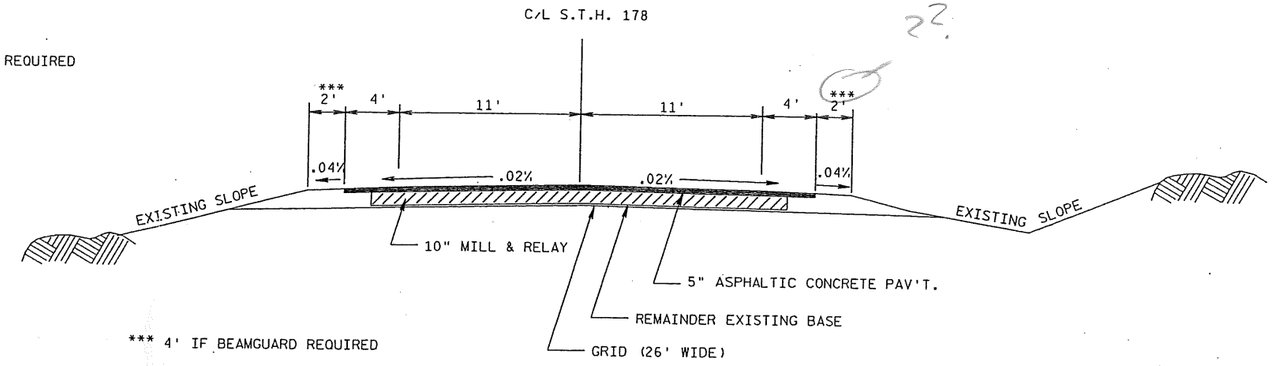
LEVELS ON - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63



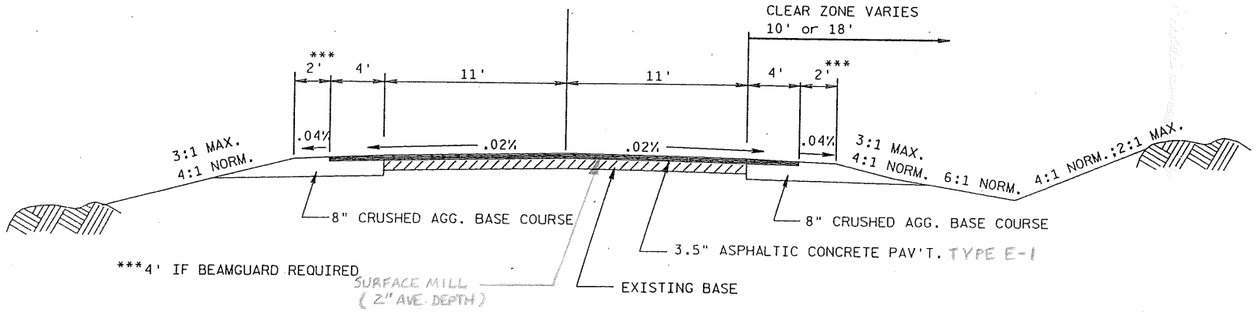
TYPICAL SECTION FOR RESURFACING (NOT TO SCALE)
S.T.H. 178

STA. 790+00 - 810+00*	STA. 952+00 - 953+00**
STA. 816+00 - 817+00*	STA. 959+00 - 960+00**
STA. 893+00 - 898+00*	STA. 961+00*
STA. 905+00 - 906+00**	STA. 998+00 - 999+00**
STA. 911+00*	STA. 1075+00*
STA. 913+00 - 919+00*	STA. 1089+00*
STA. 949+00**	STA. 1099+00 - 1103+00*

* 10' CLEAR ZONE
** 18' CLEAR ZONE



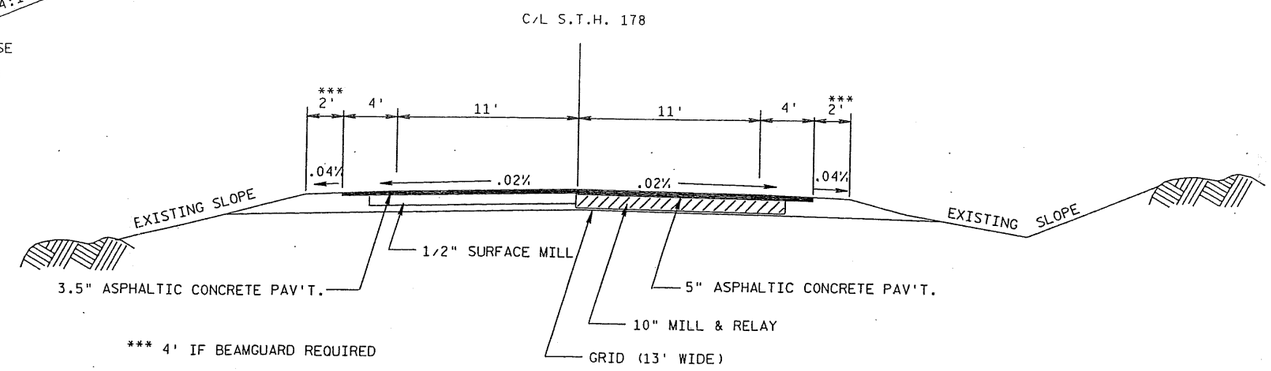
TYPICAL SECTION FOR RESURFACE/MILL & RELAY - GRID FULL WIDTH (NOT TO SCALE)
S.T.H. 178



TYPICAL SECTION FOR SHOULDER WIDENING (NOT TO SCALE)
S.T.H. 178

STA. 811+00 - 815+00*	STA. 954+00 - 958+00**
STA. 818+00 - 822+00*	STA. 962+00 - 969+00*
STA. 832+00 - 858+00*	STA. 1005+00 - 1008+00**
STA. 869+00 - 892+00*	STA. 1032+00 - 1036+00*
STA. 912+00*	STA. 1076+00 - 1083+00*
STA. 920+00 - 922+00*	STA. 1090+00 - 1098+00*
STA. 947+00 - 948+00**	STA. 1104+00 - 1110+00*
STA. 950+00 - 951+00**	STA. 1150+00 - 1163+00*

* 10' CLEAR ZONE
** 18' CLEAR ZONE



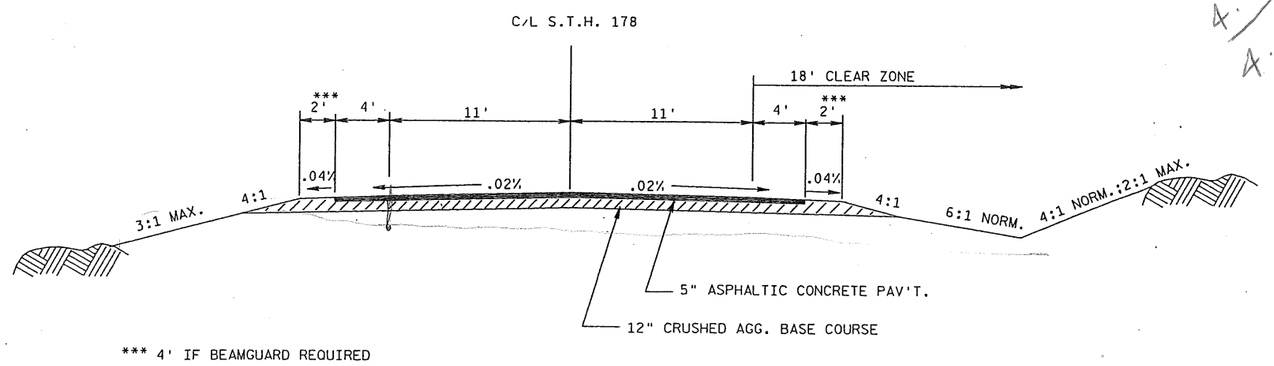
TYPICAL SECTION FOR RESURFACE/MILL & RELAY - GRID 1/2 WIDTH (NOT TO SCALE)
S.T.H. 178

STATE PROJECT NUMBER:8600-02-71	HWY: S.T.H. 178	COUNTY: CHIPPEWA	TYPICAL SECTIONS	SCALE, FEET 0	SHEET NO:	E

FILE NAME : L:\microstation\Projects\d6_86000201\020301_ts.dgn | PLOT DATE: 22-FEB-2001 11:18 | ORG DATE : 11-9-00 leo | PLOT NAME : 020301ts.i | Originator : Dist. 6 | PLOT SCALE : 10.000000:1.000000

WISDOT/CADDS SHEET 42

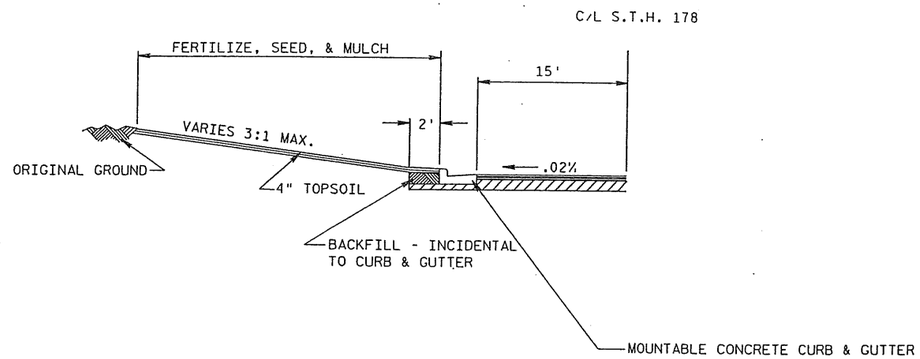
LEVELS ON • 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63



TYPICAL SECTION FOR PROFILE ADJUSTMENT (NOT TO SCALE)

S.T.H. 178

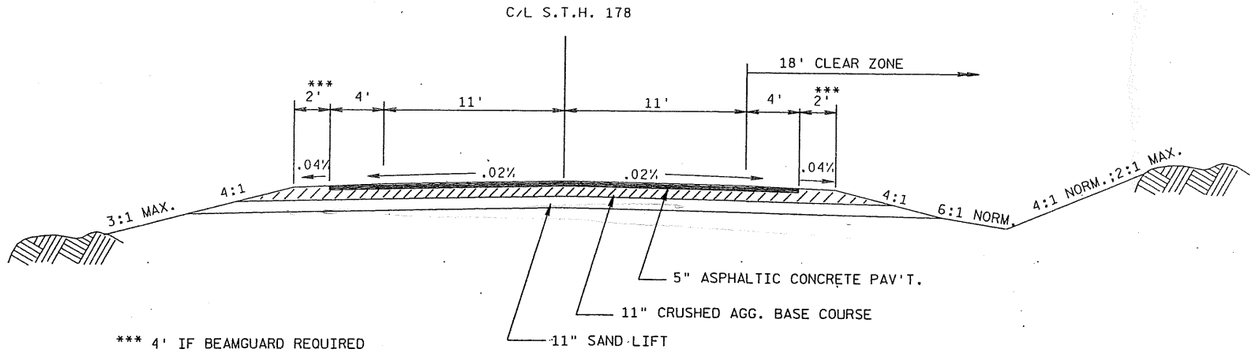
STA. 823+00 - 831+00
STA. 899+00 - 904+00
STA. 907+00 - 910+00
STA. 923+00 - 946+00
STA. 986+00 - 997+00
STA. 1000+00 - 1004+00
STA. 1063+00 - 1074+00
STA. 1084+00 - 1088+00



TYPICAL SECTION FOR CURB (NOT TO SCALE)

S.T.H. 178

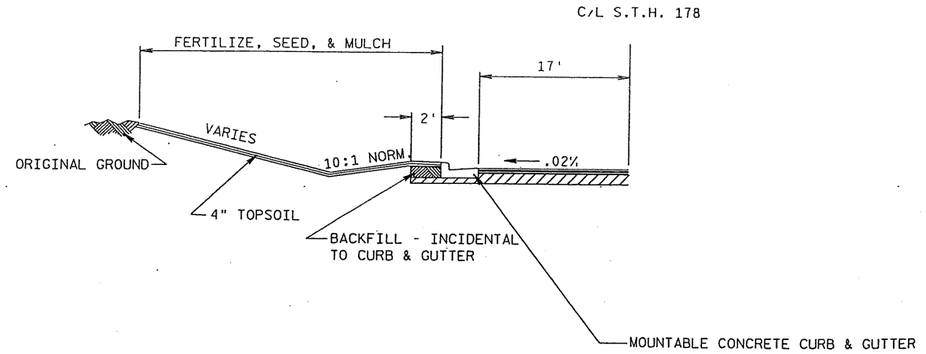
STA. 907+00 - 910+00, LEFT
STA. 914+00 - 927+00, LEFT
STA. 936+00 - 938+00, LEFT
STA. 1067+00 - 1074+00, LEFT
STA. 1067+00, RIGHT
STA. 1108+00 - 1110+00, LEFT



TYPICAL SECTION FOR RECONSTRUCTION (NOT TO SCALE)

S.T.H. 178

STA. 859+00 - 868+00
STA. 970+00 - 985+00
STA. 1009+00 - 1031+00
STA. 1111+00 - 1142+00



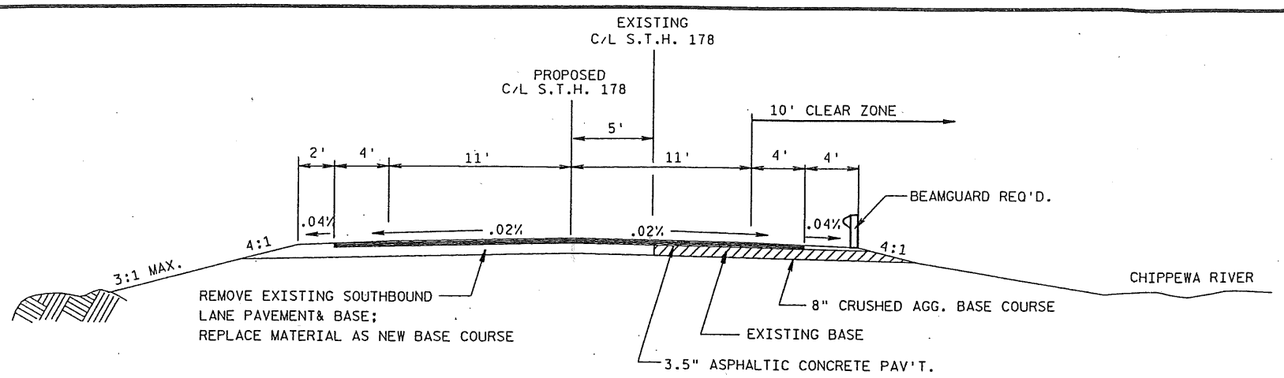
TYPICAL SECTION FOR CURB (NOT TO SCALE)

S.T.H. 178

STA. 970+00 - 982+00, LEFT
STA. 995+00 - 997+00, LEFT
STA. 1123+00 - 1127+00, LEFT

STATE PROJECT NUMBER:8600-02-71	HWY: S.T.H. 178	COUNTY: CHIPPEWA	TYPICAL SECTIONS	SCALE, FEET 0	SHEET NO: E

FILE NAME : L:\microstation\Projects\d6_86000201\020302_ts.dgn
PLOT DATE: 22-FEB-2001 11:29
ORG DATE : 11-9-00 leo
PLOT NAME : 020302 ts.i
Originator : Dist. 6
PLOT SCALE : 10.000000:1.000000
WISDOT/CADDS SHEET 42



TYPICAL SECTION FOR 5' ROADWAY SHIFT (NOT TO SCALE)

S.T.H. 178

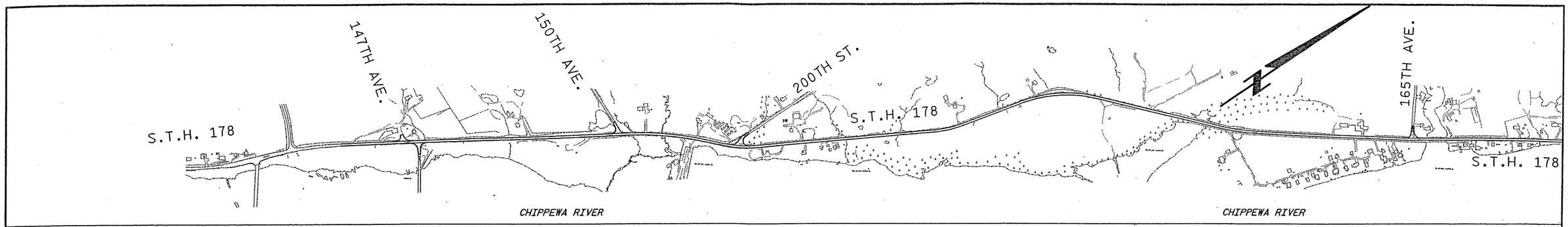
STA. 1037+00 - 1062+00
STA. 1143+00 - 1149+00

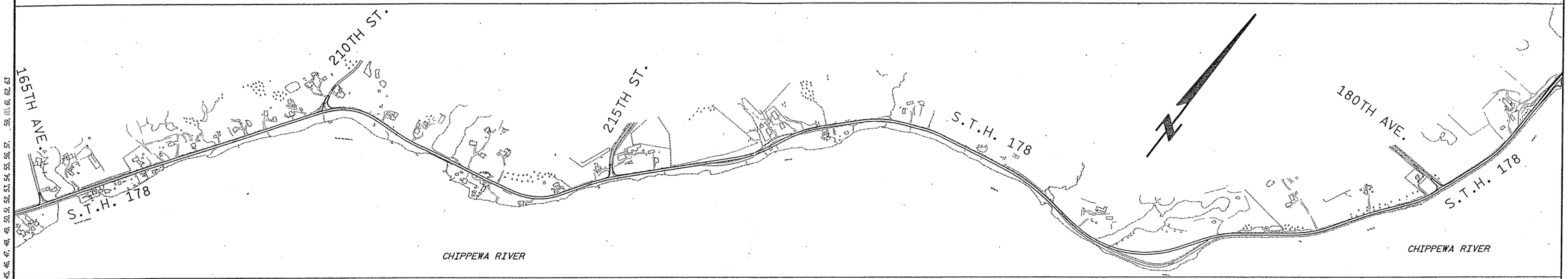
LEVELS ON - 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63

STATE PROJECT NUMBER:8600-02-71	HWY: S.T.H. 178	COUNTY: CHIPPEWA	TYPICAL SECTIONS	SCALE, FEET 0	SHEET NO:	E

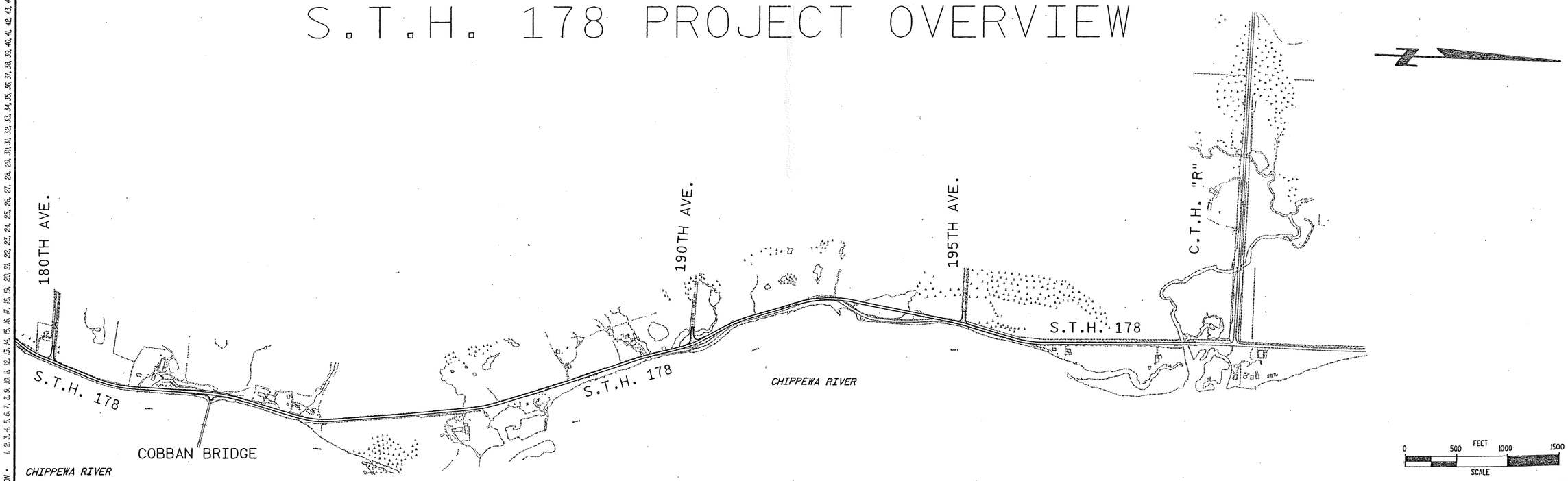
FILE NAME : L:\microstation\Projects\d6_86000201\020303_ts.dgn PLOT DATE: 22-FEB-2001 11:33 ORG DATE : 1-25-01leo PLOT NAME : 020303ts.i Originator : Dist. 6 PLOT SCALE : 10.000000:1.000000

WISDOT/CADDS SHEET 42





S.T.H. 178 PROJECT OVERVIEW

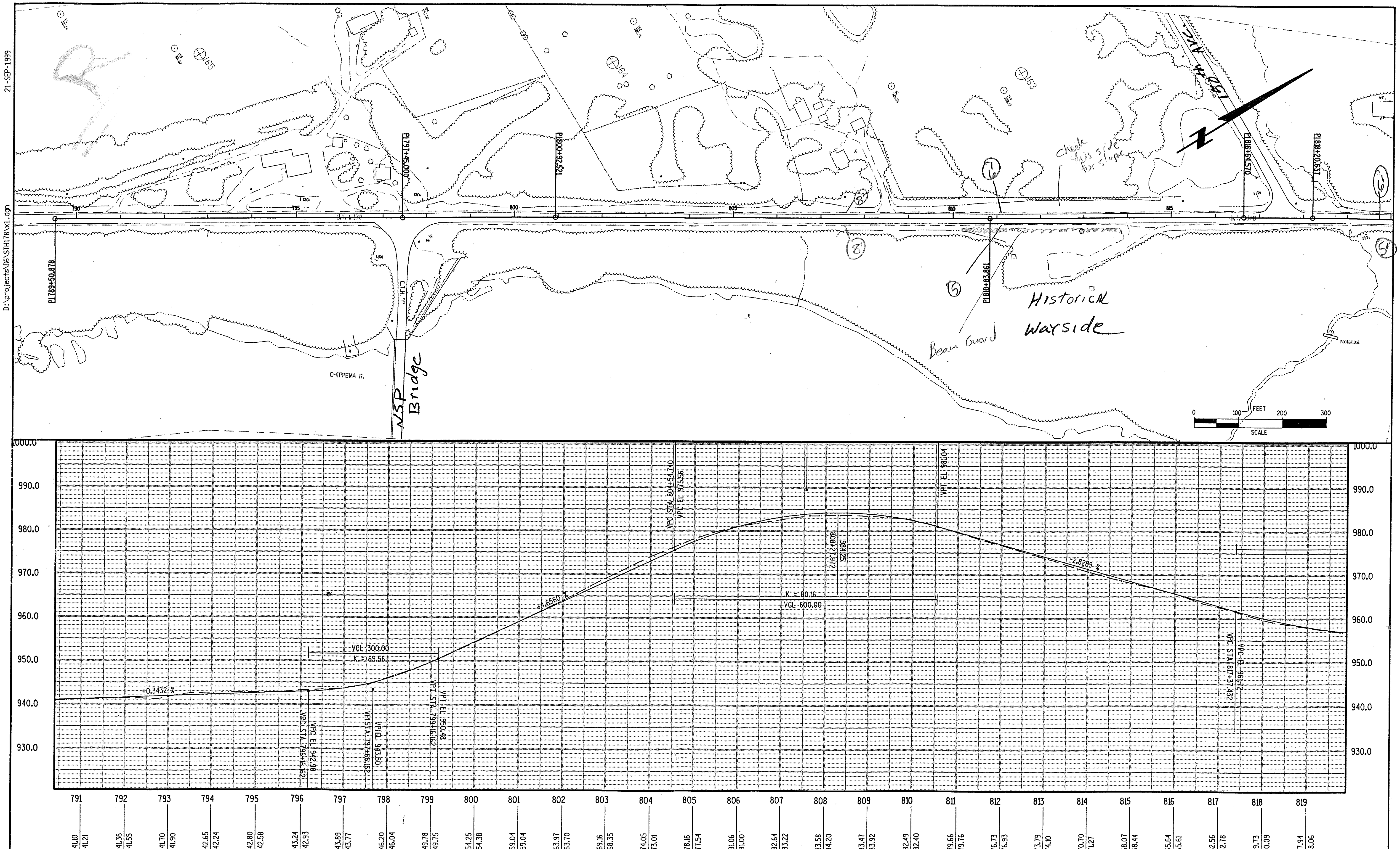


STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN	SHEET NO: .	E

Race-Track

21-SEP-1999

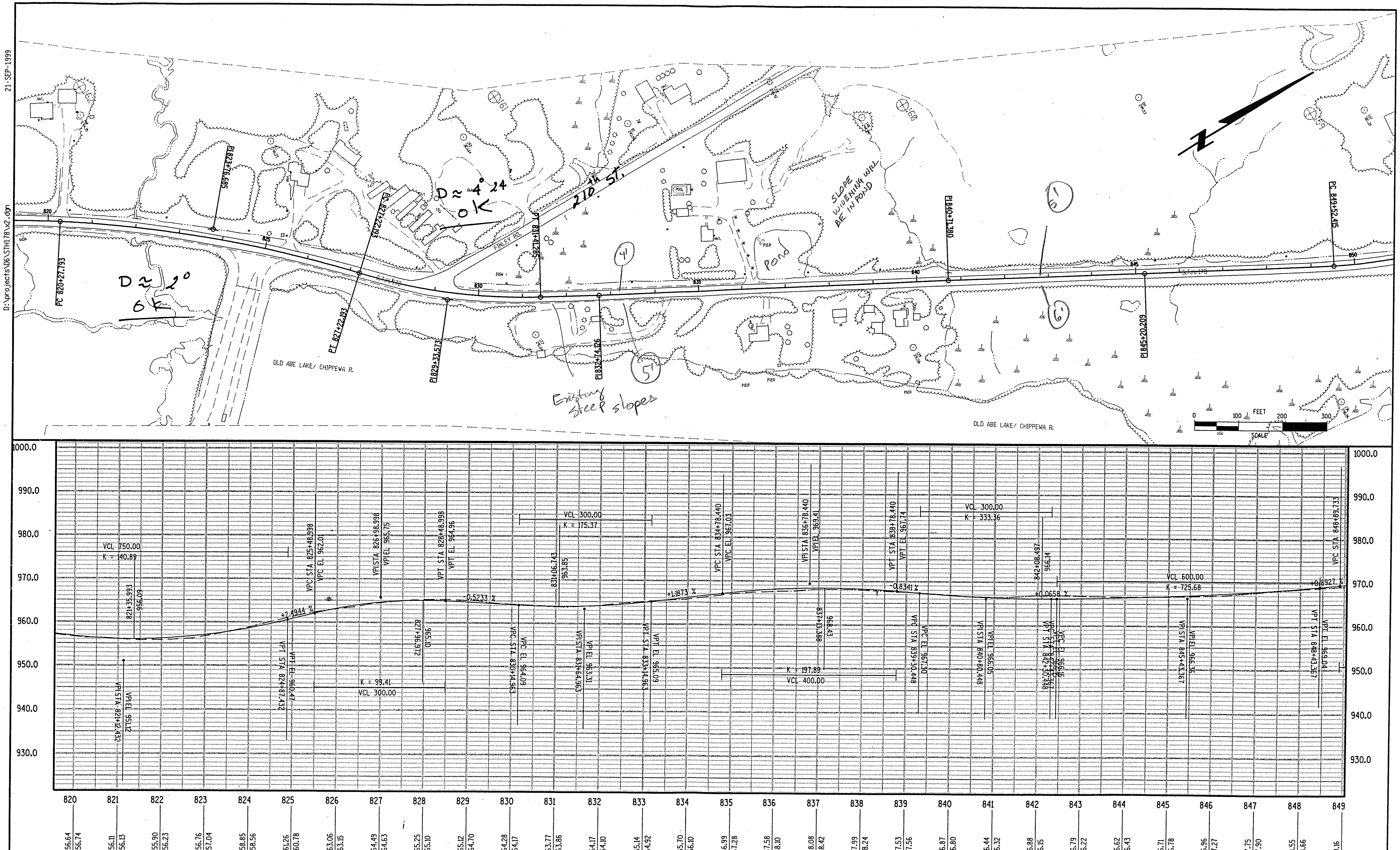
D:\projects\D6\STH178\x1.dgn



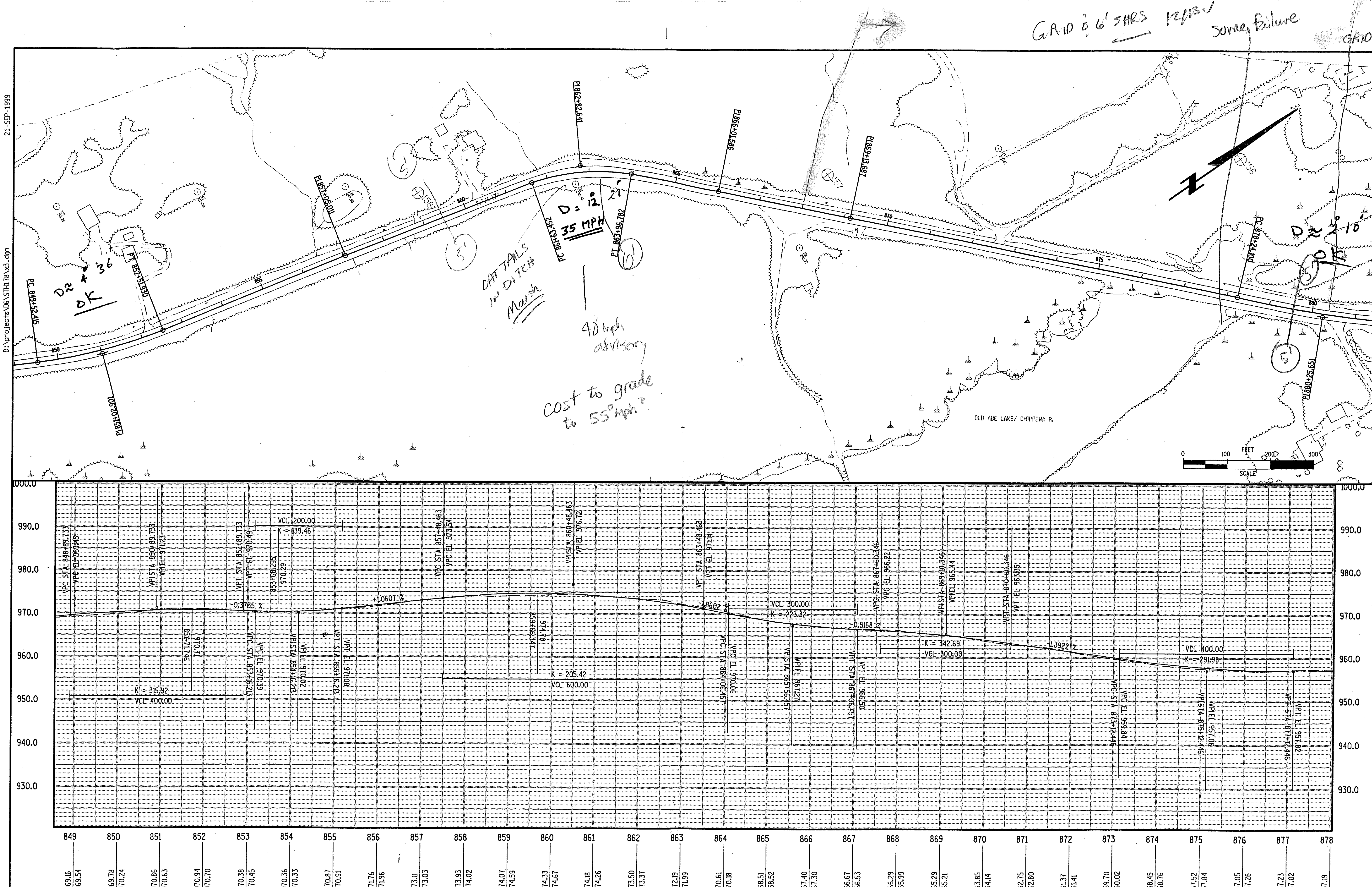
STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E

21-SEP-1999

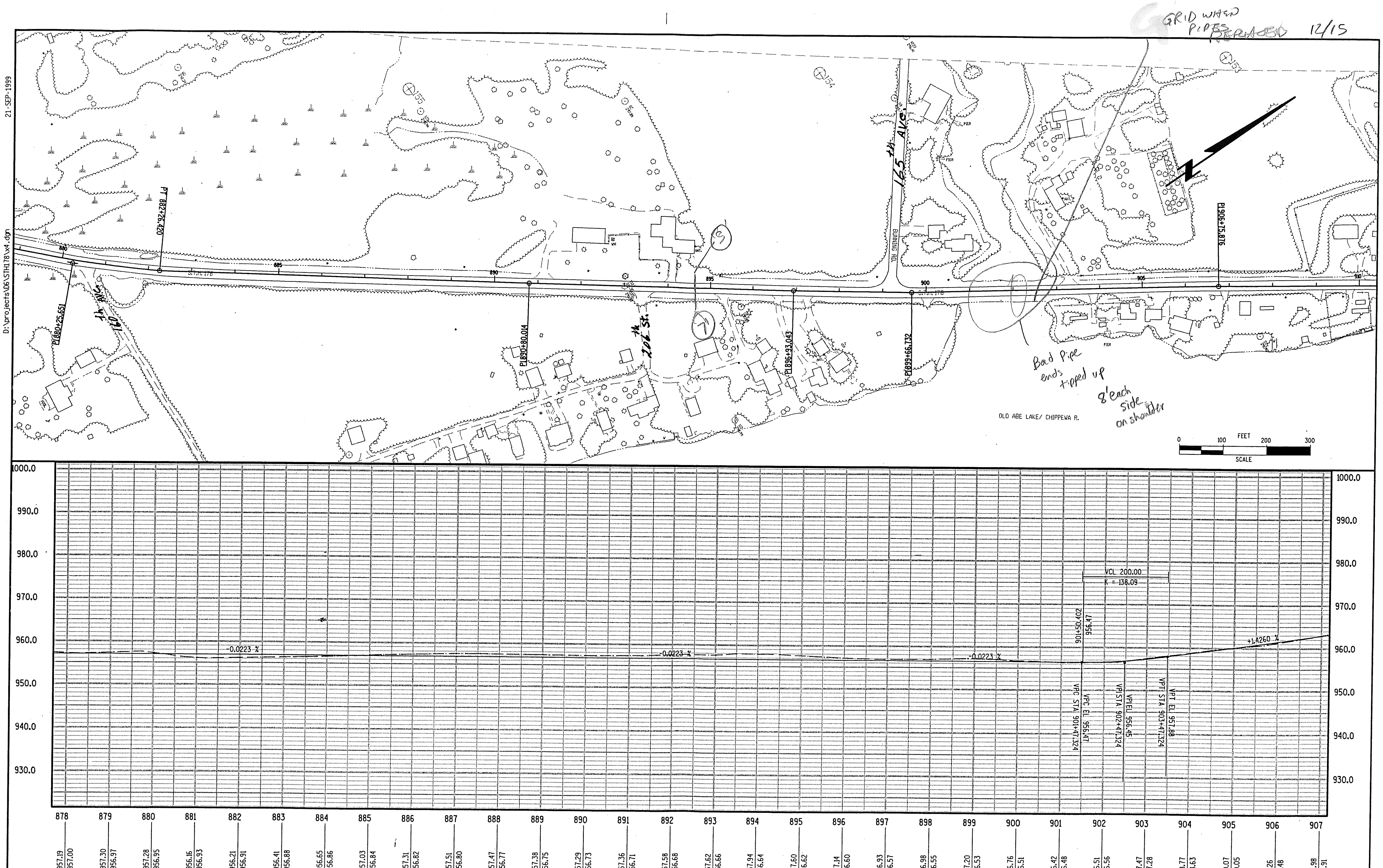
D:\projects\06\STH178\x2.dgn



STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E



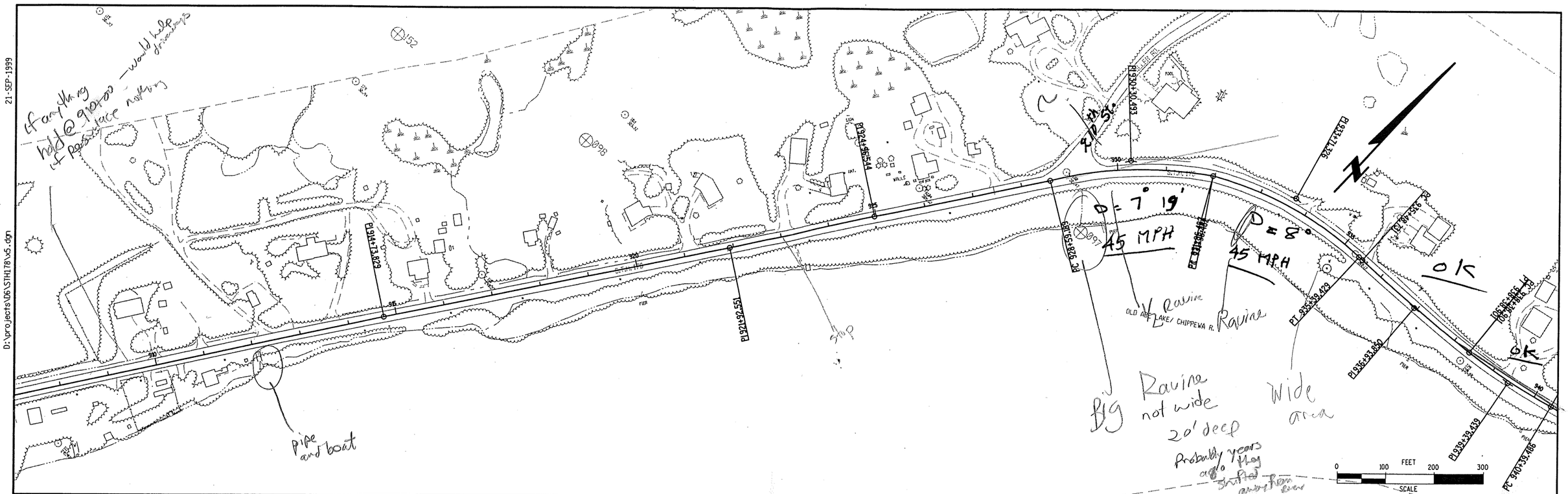
STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E

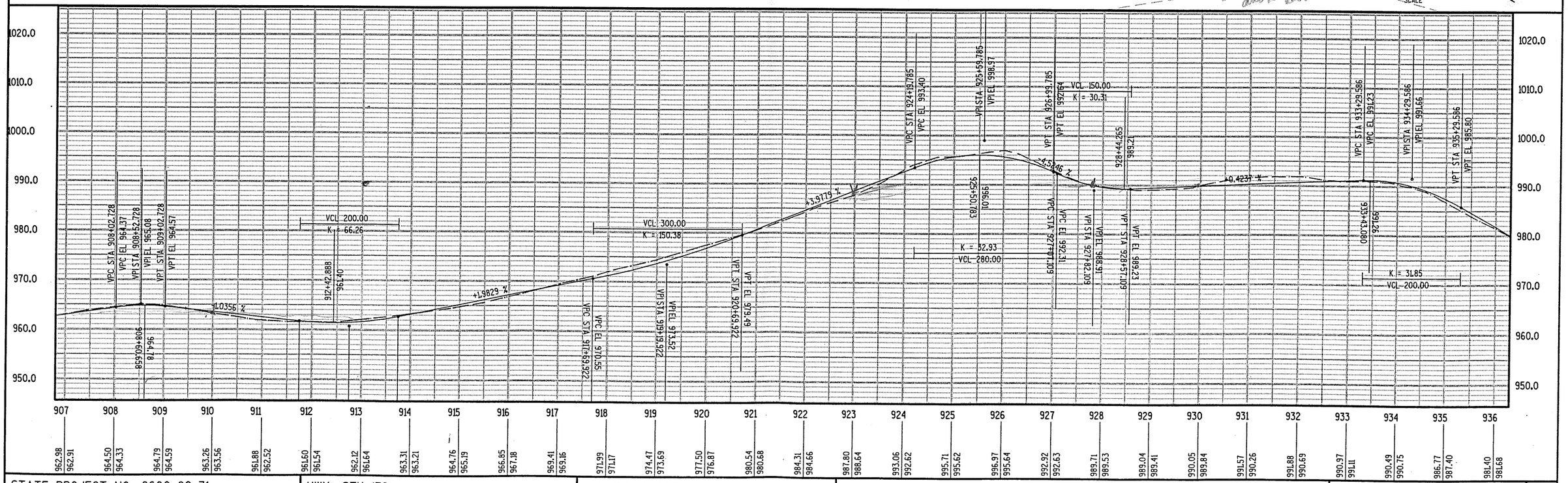


STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E

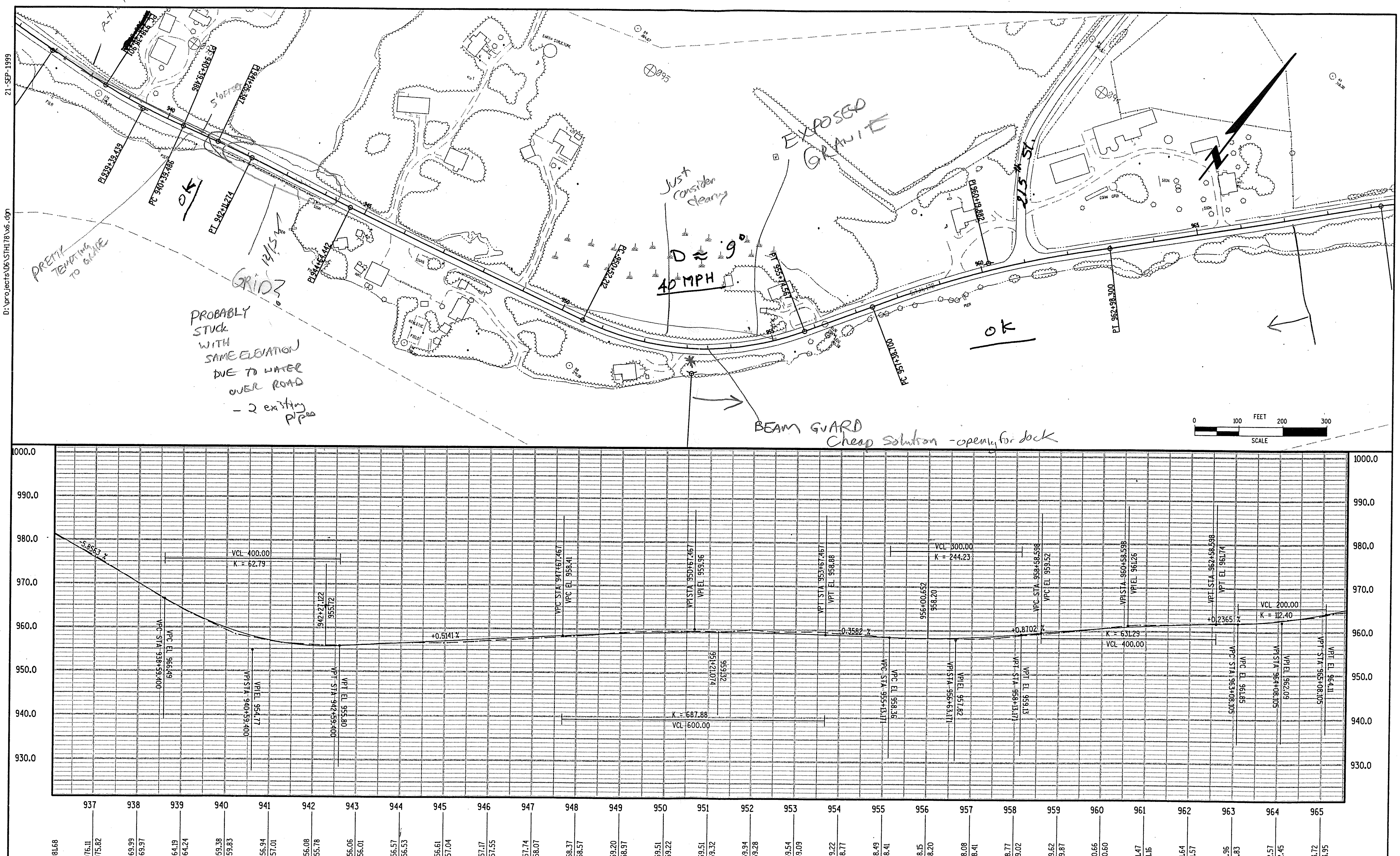
21-SEP-1999

D:\projects\06\STH178\x5.dgn





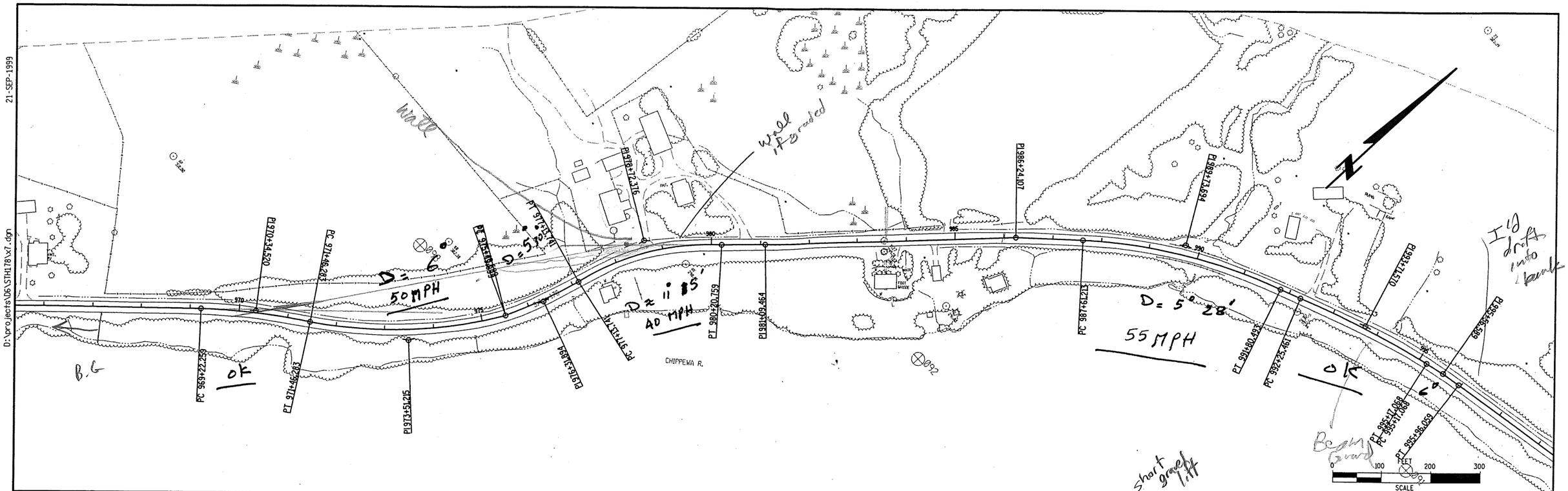
STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: . E

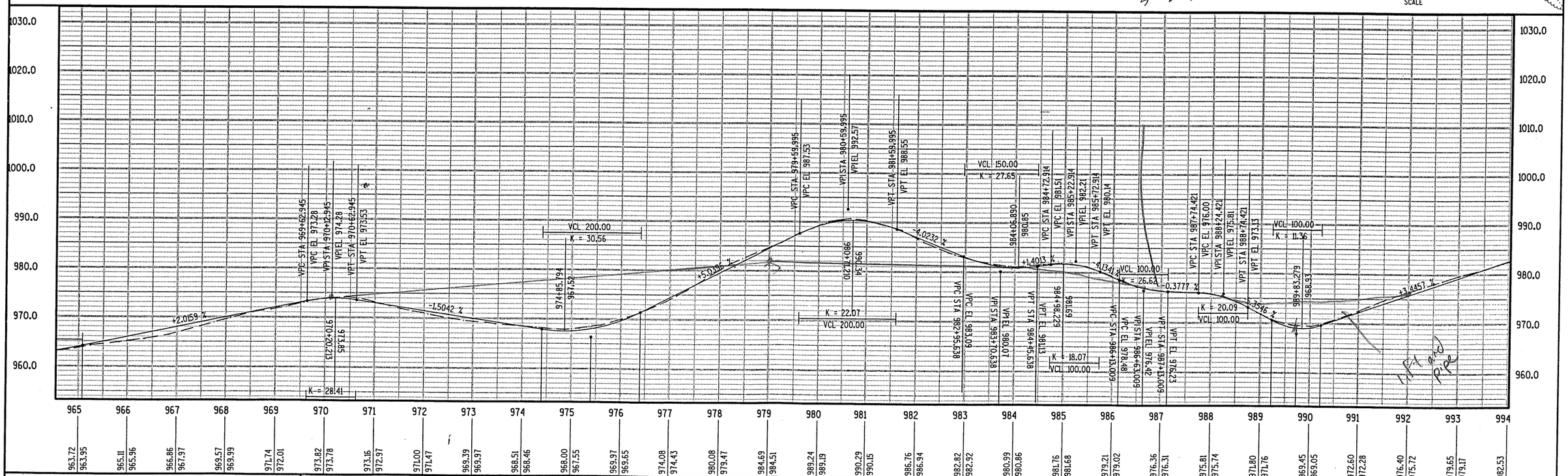


STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E

21-SEP-1999

D:\projects\D6\STH178\x7.dgn



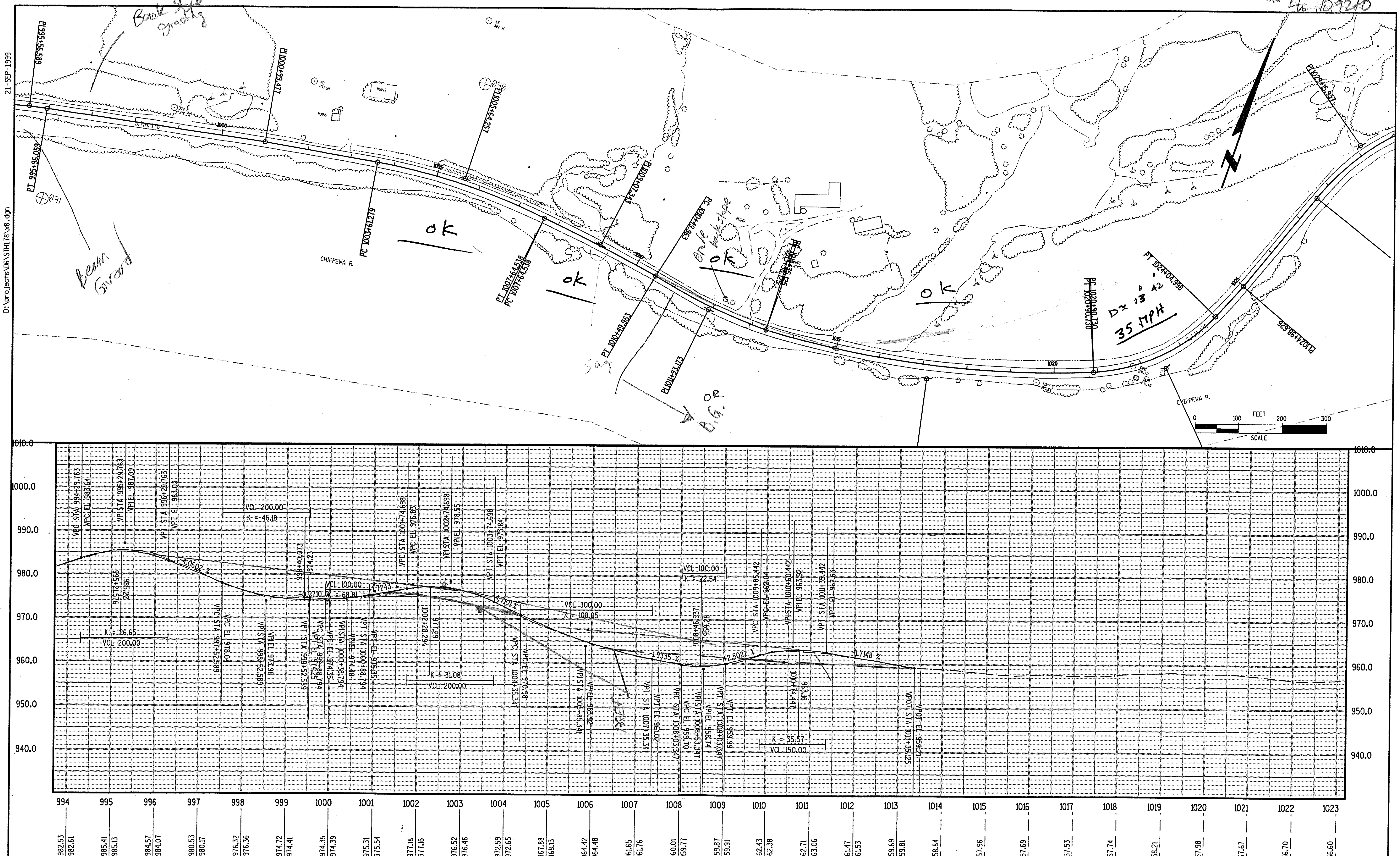


STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: . E

consider shoulder widening away from river to 1092+10

21-SEP-1999

D:\projects\06\STH178\x8.dgn



STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E

Grid 3 west side only → 12/15

21-SEP-1999

D:\projects\06\STH178\x9.dgn

PI 1029+45.937

PI 1030+63.464

PC 1034+87.839

PT 1040+34.225

PC 1044+90.594

PT 1044+64.732

PI 1038+52.785

PI 1044+32.977

PI 1045+16.874

PC 1049+74.303

PT 1051+18.723

PI 1049+74.303

PI 1050+41.019

PC 1057+15.695

PI 1054+06.004

D ≈ 10° 25'
40 MPH

D ≈ 5° 43'
50 MPH

D = 11° 55'
40 MPH

STH 178

LUREAU RD

120 AVE

0 100 FEET 200 300
SCALE

990.0	980.0	970.0	960.0	950.0	940.0	930.0	920.0

1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035	1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050	1051	1052
	956.81	957.01	957.15	957.66	959.01	960.09	958.33	957.23	957.17	957.24	957.32	957.49	957.87	958.05	957.96	957.73	957.89	957.62	957.85	957.99	958.11	957.75	957.70	957.64	957.41	956.81	956.97	957.41	957.26

STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E

21-SEP-1999

D:\projects\D6\STH178\x10.dgn

WEST GRADE 12/15 ✓

10 parallel SJ

ok

PC 1057+54.696

PT 1061+43.982

PI 1059+30.628

po-11/6' B Guard

CHIPPEWA R.

PC 1067+06.830

PI 1069+70.257

Bypass for storage 1 lane bridge

Cobban Bridge

PT 1072+29.450

B. Guard ?

Curb & Gutter

PC 1077+58.139

D 6°44'

50 MPH

PT 1080+59.565

GRADE 12/15 BOTH

S1

4-5'

PI 1079+10.451

CHIPPEWA R.

0 100 200 300 FEET

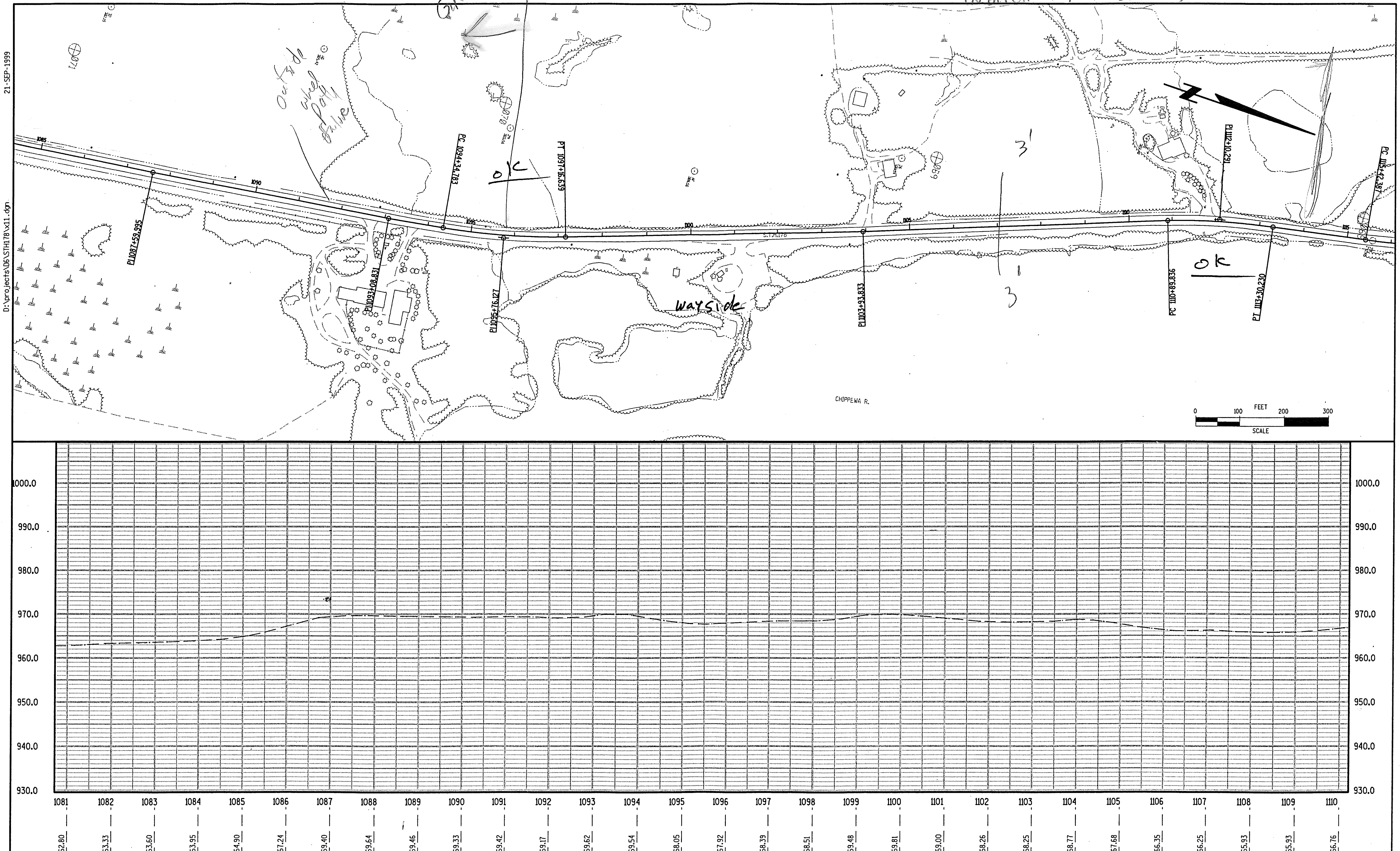
SCALE

990.0	980.0	970.0	960.0	950.0	940.0	930.0

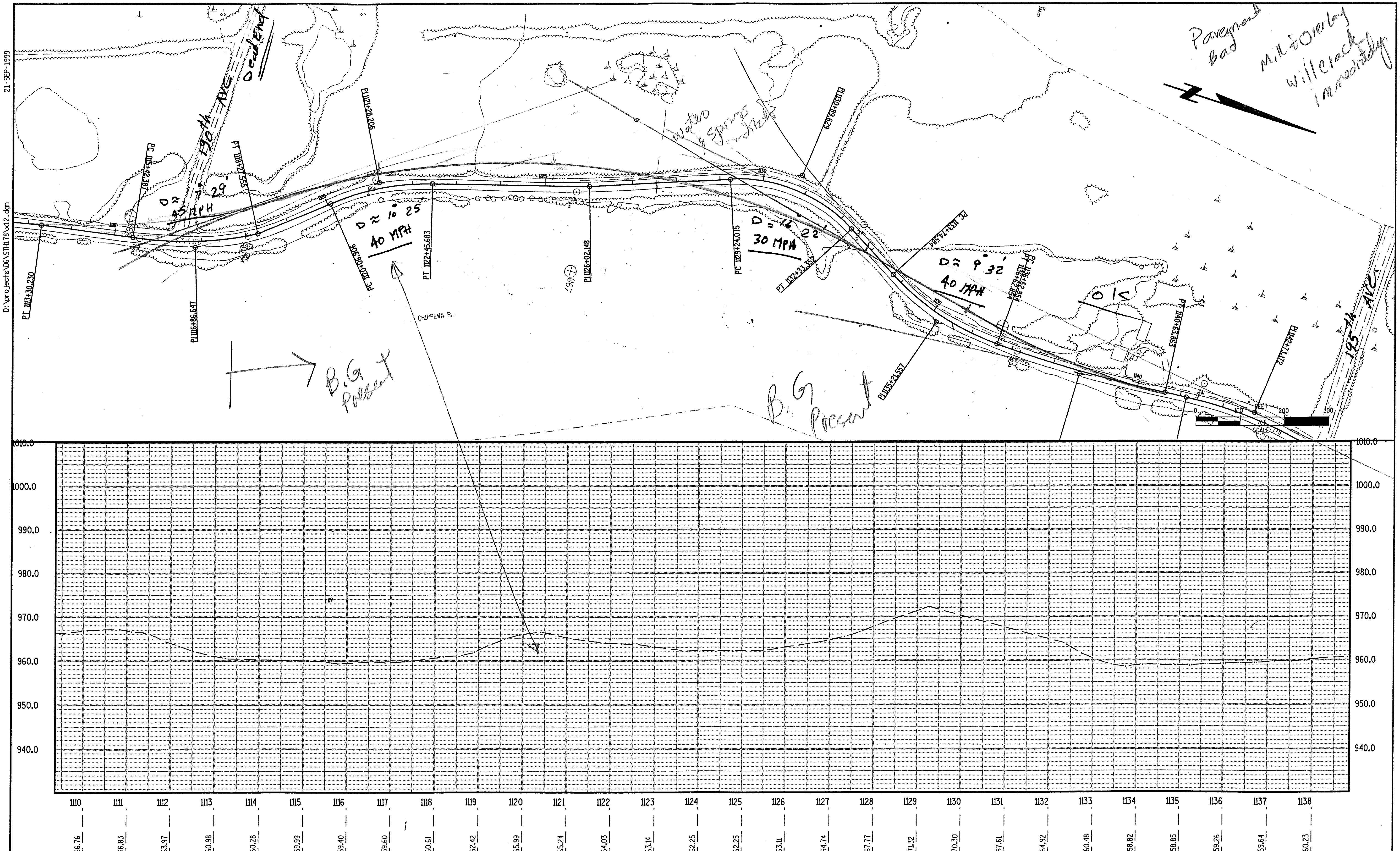
1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065	1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080	1081
957.26	957.43	957.74	957.95	958.13	958.36	958.53	958.29	958.51	959.18	958.95	959.14	960.15	961.22	961.84	963.47	965.71	966.39	965.52	963.21	962.16	962.16	962.78	963.71	963.73	962.64	961.79	961.79	962.53	962.80

STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E

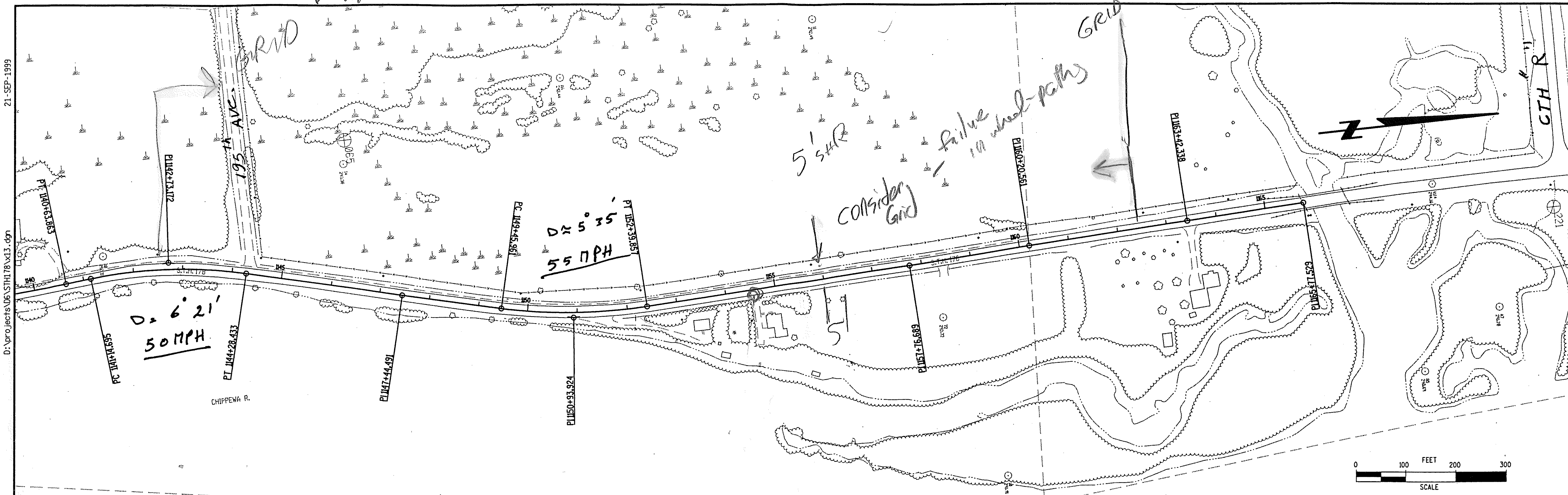
PRICE OUT BREAKER RUN IN DITCH & MOUNTABLE CURB

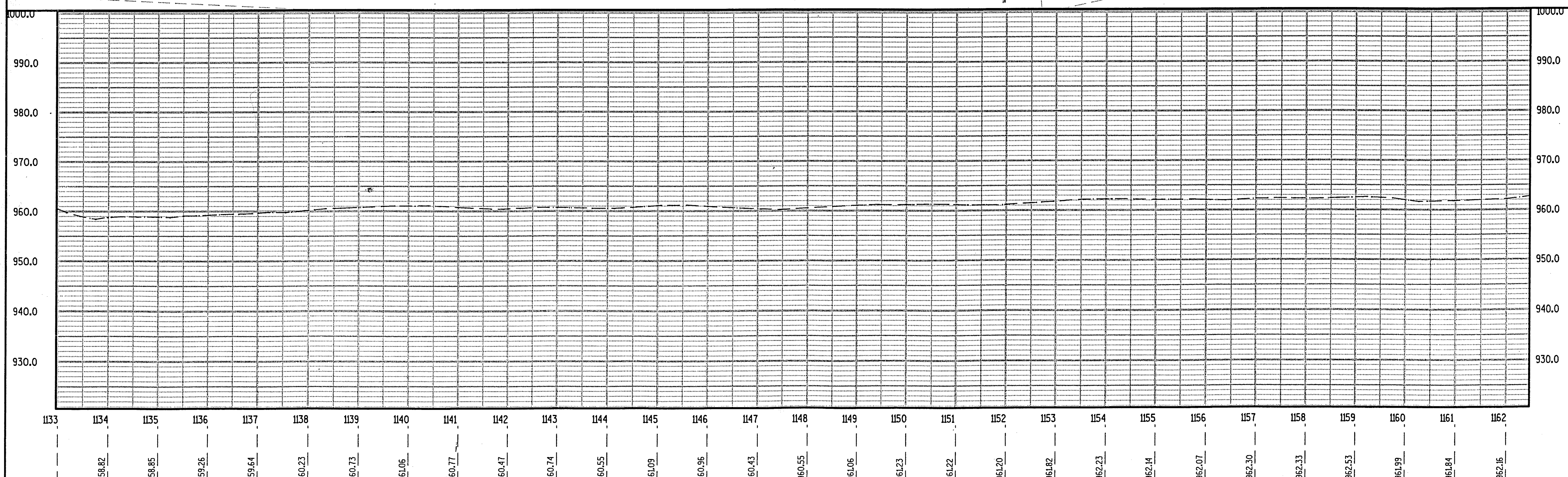


STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E



STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E





STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E

CORRESPONDENCE/MEMORANDUM State of Wisconsin
DISTRICT #6

Date: July 16, 1998

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: **PAVEMENT DESIGN REPORT**
Approval Letter

Project I.D. 8600-02-01
Chippewa Falls - Cornell Road
Jim Falls - CTH R
STH 178
Chippewa County

Upon review of the attached pavement design documentation, the pavement type selection recommendations are approved for the above mentioned project segments.

Reviewed: COMMENTS

7/16/98
Richard J. Shermo, P.E. Date
District #6 Area Supv.-Project Development Section

Approved: COMMENTS

10/20/98
Michael S. Ostrowski, P.E. Date
District #6 Manager-Project Development Section

Have some concern about the slight horizontal alignment "shifts" which puts New & over the old ditch line. Randy, can you set up a meeting so the 4 of us can discuss? Week of Aug 3rd.
MSO

RJS 7/16/98
MSO 7/23/98
MMH 7/23/98

Cpy → RWL

CORRESPONDENCE/MEMORANDUM State of Wisconsin
DISTRICT #6

Date: July 16, 1998

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: **PAVEMENT DESIGN REPORT**
Approval Letter

Project I.D. 8600-02-01
Chippewa Falls - Cornell Road
Jim Falls - CTH R
STH 178
Chippewa County

Upon review of the attached pavement design documentation, the pavement type selection recommendations are approved for the above mentioned project segments.

Reviewed: COMMENTS

Richard J. Shermo, P.E. Date
District #6 Area Supv.-Project Development Section

Approved: COMMENTS

Michael S. Ostrowski, P.E. Date
District #6 Manager-Project Development Section

State of Wisconsin
Transportation District #6

CORRESPONDENCE/MEMORANDUM

Date: July 16, 1998

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: Pavement Design Report
Project 8600-02-01
Chippewa Falls - Cornell
Jim Falls - CTH R
STH 178
Chippewa County

EXECUTIVE SUMMARY

This report makes the following recommendations for the proposed reconstruction project.

LOCATION	PAVEMENT STRUCTURE	THICKNESS
STH 178-mainline & bypass lanes	Asphalt/ Base Course/ Sand Lift	125mm/275mm/275mm (5") /(11") /(11")
Side Roads >500 ADT	Asphalt/ Base Course	100mm/300mm (4") /(12")
Side Roads <500 ADT	Asphalt/Base Course	75mm /225mm (3") /(9")

Type MV Asphaltic Concrete Pavement mix with PG grade 58-28 should be used for this project. It is anticipated that by the time this plan is let to bid, a different PG graded oil could be the standard. The designer should coordinate the special provisions to reflect the correct AC type.

The 125mm(5") asphalt pavement should be constructed with two lower layers totaling 85mm(3 ½") and a upper layer of 40mm(1 ½"). The 100mm(4") asphalt pavement should be constructed with a 50mm(2") lower layer and a 50mm(2") upper layer. The 75mm(3") asphalt pavement should be constructed with two layers.

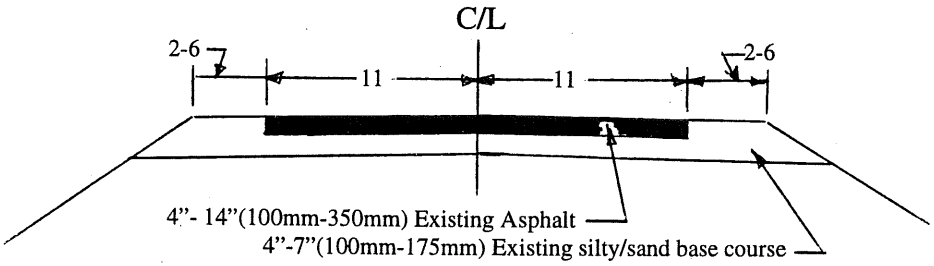
The sand lift should be specified to meet Grade #1 requirements as specified in the Standard Specifications Section 209.2.2 for granular backfill.

EXISTING CONDITIONS

This 11.9km(7.4 mile) project involves the portion of STH 178 from the intersection of CTH Y at Jim Falls northerly along the Chippewa River to the intersection of CTH R. Due to a high accident rate, as stated in the CDR, the roadway will be reconstructed to C3 standards. This roadway is not being reconstructed due to excessive pavement failures or deficiencies. It appears that the roadway was last resurfaced in 1981 with a maintenance type overlay. The 1996 PDI ranged from 28-75 for this section. The 1997 IRI ranged from 1.4-3.6.

In 1993, the roadway core was investigated for a resurfacing type project. Since that time, the concept was revised to a reconstruct type improvement. The 1993 borings are located in the technical services project records.

EXISTING TYPICAL



TRAFFIC PROJECTIONS

The construction year- 0 year ADT is 2000 and the 20 year ADT is projected to be 2400.

Truck percentages are as follows:

TRUCK TYPE	%
2D	3.6
3AX	1.3
2SI,2S2	0.8
3-S2	2.3
DBL.BTM	0.0
TOTAL	8.0

PROPOSED IMPROVEMENT

This project is currently scheduled for a reconstruct(RECST) type improvement. The existing roadway will be reconstructed to C3 standards which will include adjustments to the horizontal and vertical alignments.

SOIL ENGINEERING FACTORS

Over the length of this project, many different soil series are located under the roadway. The roadway core itself, as revealed in the 1993 roadway borings, has various amounts of silt and topsoil present along with some granular material in some of the fill locations. With the existing roadway material varying from moist to wet, construction could be a problem. With the existing silty materials in mind, it was agreed to with the Soils Engineer- Lary Hyland that a sand lift would be the best choice in this situation. For further discussion see the "alternative evaluated section". The DGI recommended for this roadway is 14 with a soil support value of 4.0. At the time of this report, due to the uncertainty of the horizontal and vertical alignment only a preliminary soils analysis has been completed.

FRICTION CHARACTERISTICS

The aggregate is expected to be igneous with 0% dolomite and a 20% L.A. wear resulting in a friction number of 44 and 51 for the PCC. Friction is not expected to be a problem.

ALTERNATIVES EVALUATED and RECOMMENDATIONS

Alternative Discussion

Initially, this segment of roadway was scheduled for a maintenance type overlay in 1998. That project was scrapped and the roadway segment is now being evaluated as a reconstruct to C3(100KM/60MPH) standards. In January 1997, the project was explained to me as a typical shoulder widening project on the south end with some short segments of relocation from the middle of the project northward to CTH R. Since that time, evaluation by the development staff has led to a concept of a total reconstruction.

I have numerous concerns that need to be addressed. The horizontal alignment, provided at the time of this report, continually drifts on and off the centerline of the existing road core in a range of 0-8 feet(0-2.5m). We have had past mid lane failures in minor grading areas when part of the old core supports the new lane and new material is added adjacent to support the remaining lane. Besides the obvious heave potential of the different materials, differential settlement occurs in the new material due to different compaction levels of the new material versus the old road core. As shown on the plan sheets and preliminary sections, in many cases, the subgrade point is being moved out over wet silty marshy material in the old ditches. Also in many locations, water is within 2-3 feet of the pavement surface. At this point in the design process, I can only assume that the designer will follow through with his/her responsibility to provide information to and coordinate with the district Soils Engineer to identify and treat these problem areas once the final horizontal and vertical alignment is chosen. In past situations of widening over old ditches, these areas have either been excavated and back-filled or a grid/back-fill combination was used. The high water table is a separate issue, as obviously it is hard to construct a stable subgrade within 1-2 feet of the existing water elevation. There is a reasonable chance that the asphalt/base/sand lift pavement will not perform in this situation . The designer should remember that a sand lift or breaker run platform will typically push the subgrade to 2 feet or greater below the finished profile.

Alternative Discussion-cont.

On other projects/roadways of this type, past experience had led to a district sequence of operations where the horizontal alignment is left in place and the shoulders are widened and raised to the existing profile. If a sag vertical deficiency exists in this area we will typically gravel lift up to a foot to improve the profile. Crest and sag verticals are routinely excepted to standards of 40 mph if there is no accident history at that location. After the widening or lifting is completed the traveled way surface is addressed with some type of overlay or mill/pulverize & relay and overlay combination, always taking care to remain in the middle of the old roadway core. We typically do experience some shoulder distortion but it is not critical to the performance of the pavement. Besides achieving pavement performance, this operation also has the benefit of providing adequate local access because, typically 2 lane traffic can be provided in the off hours and on weekends during the life of the project.

With reconstruction of the existing STH 178 roadway the project option chosen versus the above mentioned scenario, local access and staging of construction activities will both play major roles in the plan development. Since local access will need to be provided, I am assuming a grading operation will need to be completed one half at a time with excavation, EBS, back-fill, borrow, sand lift and base course progressing down the roadway as access permits. The relocation areas are typically completed separately with the old road in these relocated areas being obliterated at the end. For the sand lift to perform in the pavement structure, the sand cannot be placed on a rutted un-rolled subgrade. This typically requires the contractor to exercise care in the placing of the lift material. Some type of drain will be required at the low points in the sand lift profile. A breaker run was not chosen due the availability of local materials.

With this type of work, it is beneficial to work during the dry part of the summer. Even with these precautions, there is a reasonable chance that stage construction grading might not be completed in one year. Soft spots in the base could be common place under the reconstruct option. If the base course and the two lower layers were placed in year one, the surface layer could be placed the following year. This approach would allow some repair of the broken up areas prior to the final surface being placed.

SUMMARY OF COSTS-----*LCCA*

A twenty year service life was used.

The first alternative is : 175mm(7") PCC over 150mm(6") base over sand lift:
$219008 per KM for initial construction cost
$ 11463 per KM for Equivalent Uniform Annual Cost

The second alternative is : 125mm(5") AC over 275mm(11") base course over 275mm(11") sand lift:
$155257 per KM for initial construction cost
$ 9759 per KM for Equivalent Uniform Annual Cost

The third alternative is : 140mm(5 ½")AC over 300(12") base course *
$157763 per KM for initial construction cost
$ 9921 per KM for Equivalent Uniform Annual Cost

* Not recommended due to sand lift requirement. For information purposes only

RECOMMENDATIONS

LOCATION	PAVEMENT STRUCTURE	THICKNESS
STH 178-mainline & bypass lanes	Asphalt/ Base Course/ Sand Lift	125mm/275mm/275mm (5") /(11") /(11")
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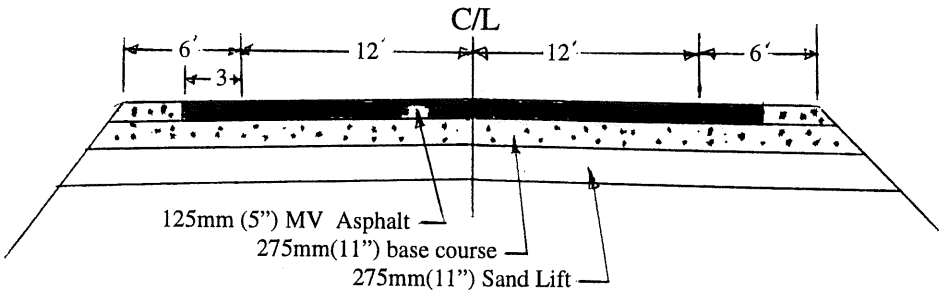
The 125mm(5") asphalt pavement should be constructed with two lower layers totaling 85mm(3 ½") and a upper layer of 40mm(1 ½"). The 100mm(4") asphalt pavement should be constructed with a 50mm(2") lower layer and a 50mm(2") upper layer. The 75mm(3") asphalt pavement should be constructed with two layers.

The sand lift should be specified to meet Grade #1 requirements as specified in the Standard Specifications Section 209.2.2 for granular backfill.

The designer should use asphaltic surface items for incidental asphalt work such as driveways, safety islands, etc. as allowed under the 1997 Supplemental Specs.

Randy W. Luedtke, P.E.

PROPOSED TYPICAL



RIGID PAVEMENT DESIGN WORKSHEET

Version 3.3

07/13/98

8600-02-01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

TRAFFIC:

CONSTRUCTION YEAR	2002
CONSTRUCTION YEAR ADT	2,000
DESIGN YEAR	2022
DESIGN YEAR ADT	2,400
DIRECTIONAL FACTOR (DF)	0.50
LANE DISTRIBUTION FACTOR (LDF)	1.00
TRAFFIC ANALYSIS PERIOD	20.0
DESIGN LANE TRAFFIC (DLT)	1,100

LOADING:

TRUCK TYPE	% OF ADT	DLT	# TRUCKS	ESAL LOAD FACTOR	ESAL'S
2D	3.6	1,100	40	0.3	12
3-SU	1.3	1,100	14	1.2	17
2S-1,2S-2	0.8	1,100	9	0.6	5
3S-2	2.3	1,100	25	1.6	40
DBL BTM	0.0	1,100	0	2.1	0
DESIGN LANE DAILY ESAL's	8.0				74
DESIGN LANE TOTAL LIFE ESAL's					540,200

SOILS:

MODULUS OF SUBGRADE REACTION (K)	30

THICKNESSES:

CALCULATED PAVEMENT THICKNESS	155
PAVEMENT THICKNESS TO BE USED	175

FLEXIBLE PAVEMENT DESIGN WORKSHEET

Version 3.3

07/13/98

8600–02–01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

TRAFFIC:

CONSTRUCTION YEAR	2002
CONSTRUCTION YEAR ADT	2,000
DESIGN YEAR	2022
DESIGN YEAR ADT	2,400
DIRECTIONAL FACTOR (DF)	0.50
LANE DISTRIBUTION FACTOR (LDF)	1.00
TRAFFIC ANALYSIS PERIOD	20.0
DESIGN LANE TRAFFIC (DLT)	1,100

LOADING:

TRUCK TYPE	% OF ADT	DLT	# TRUCKS	ESAL LOAD FACTOR	ESAL's
2D	3.6	1,100	40	0.3	12
3–SU	1.3	1,100	14	0.8	11
2S–1,2S–2	0.8	1,100	9	0.5	4
3S–2	2.3	1,100	25	0.9	23
DBL BTM	0.0	1,100	0	2.0	0
DESIGN LANE DAILY ESAL's	8.0				50
DESIGN LANE TOTAL LIFE ESAL's					365,000

SOILS:

DESIGN GROUP INDEX	14
SOIL SUPPORT VALUE	4.0
FROST INDEX	F–3

DESIGN – SN VALUE & MIX TYPE:

SERVICEABILITY INDEX	3.0
REQUIRED SN VALUE	3.49

ASPHALT MIX TYPE: MV

ALTERNATE DESIGN:

LAYER	Asphalt/base/sand THICKNESS	COEFF.	SN	Asphalt/base THICKNESS	COEFF.	SN
SURFACE:		**SURFACE**			**SURFACE**	
ASPHALTIC CONCRETE	125	0.0173	2.16	140	0.0173	2.42
EXISTING ASPHALT		0.0100	0.00			0.00
BASE COURSE:		**BASE**			**BASE**	
CRUSHED AGG. BASE COURSE	275	0.0039	1.07	300	0.0039	1.17
OPEN GRADED BASE COURSE #1			0.00			0.00
OPEN GRADED BASE COURSE #2			0.00			0.00
EXISTING BASE		0.0039	0.00		0.0039	0.00
EXISTING AC			0.00			0.00
PULVERIZED AC			0.00			0.00
EXISTING PCC			0.00			0.00
RUBBLIZED PCC			0.00			0.00
CRACK (BREAK) & SEAT PCC			0.00			0.00
SUBBASE COURSE:		**SUBBASE**			**SUBBASE**	
CRUSHED AGG. BASE COURSE			0.00			0.00
BREAKER RUN			0.00			0.00
GRANULAR SUBBASE	275	0.0012	0.33			0.00
EXISTING SAND LIFT		0.0025	0.00		0.0025	0.00
TOTAL SN VALUE			3.57			3.59

FLEXIBLE PAVEMENT DESIGN

ALTERNATE DESIGN:

LAYER	Existing Structure THICKNESS	COEFF.	SN	THICKNESS	COEFF.	SN
SURFACE:		**SURFACE**			**SURFACE**	
ASPHALTIC CONCRETE	125	0.0173	2.16		0.0173	0.00
EXISTING ASPHALT			0.00			0.00
BASE COURSE:		**BASE**			**BASE**	
CRUSHED AGG. BASE COURSE			0.00		0.0039	0.00
OPEN GRADED BASE COURSE #1			0.00			0.00
OPEN GRADED BASE COURSE #2			0.00			0.00
EXISTING BASE	125	0.0039	0.49			0.00
EXISTING AC			0.00			0.00
PULVERIZED AC			0.00			0.00
EXISTING PCC			0.00			0.00
RUBBLIZED PCC			0.00			0.00
CRACK (BREAK) & SEAT PCC			0.00			0.00
SUBBASE COURSE:		**SUBBASE**			**SUBBASE**	
CRUSHED AGG. BASE COURSE			0.00			0.00
BREAKER RUN			0.00			0.00
GRANULAR SUBBASE			0.00		0.0012	0.00
EXISTING SAND LIFT		0.0025	0.00			0.00
TOTAL SN VALUE			2.65			0.00

SN is Less Than SNreq'd

PAVEMENT SURFACE FRICTION DESIGN

Version 3.3

07/13/98

8600-02-01
Chippewa Falls - Cornell
Jim Falls - CTH R
STH 178

Chippewa

TRAFFIC:

CONSTRUCTION YEAR ADT	2,000		
DESIGN YEAR ADT	2,400	EXP. GROWTH RATE	0.92%
DIRECTIONAL FACTOR (DF)	0.50		
LANE DISTRIBUTION FACTOR (LDF)	1.00		
% HEAVY VEHICLES (HV)	8.0		
AC PAVEMENT AGE OR SERVICE LIFE (YR)	15.0	AC "AGE" ADT	2,293
AC LAVP AT SPECIFIED AGE (IN MILLIONS)	5.876		
PC PAVEMENT AGE OR SERVICE LIFE (YR)	25.0	PC "AGE" ADT	2,512
PC LAVP AT SPECIFIED AGE (IN MILLIONS)	10.293		

AGGREGATE PROPERTIES:

	AC MIX AGGREGATES	PCC MIX AGGREGATES
% DOLOMITE	0	0
% LA WEAR	20	20

AC AGGREGATE SOURCE:
PCC AGGREGATE SOURCE:

DESIGN:

ASPHALTIC SURFACE FORMULA

$$FN40 = 41.4 - 1.45 \ln(LAVP) + 0.245(LAWEAR) - 0.00075(DOLOMITE)^2$$

FN40 AT SPECIFIED PAVEMENT AGE	43.7
% PROBABILITY THAT CALCULATED VALUE IS < 35	7.9

AGE (YR) WHEN FN40=35	AGE>50

CONCRETE SURFACE FORMULA

$$\ln(FN40) = 3.99 - 0.0419\ln(LAVP) - 0.00129(DOLOMITE) + 0.00474(HV)$$

FN40 AT SPECIFIED PAVEMENT AGE	50.9
% PROBABILITY THAT CALCULATED VALUE IS < 35	<0.05%

AGE (YR) WHEN FN40=35	AGE>50

BID ITEM COSTS

Version 3.3

07/13/98

8600–02–01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

BID ITEM	BID ITEM #	UNITS	UNIT COST
ASPHALTIC MATERIAL FOR TACK COAT	40204	L	$1.00
ASPHALTIC MATERIAL FOR PLANT MIXES	40501	Mg	$155.00
ASPHALTIC CONCRETE PAVEMENT, TYPE HV	40712	Mg	$22.00
ASPHALTIC CONCRETE PAVEMENT, TYPE MV	40713	Mg	$16.50
ASPHALTIC CONCRETE PAVEMENT, TYPE LV	40714	Mg	$16.50
RECYCLED ASPHALTIC SURFACE, TYPE HV	90381	Mg	
RECYCLED ASPHALTIC SURFACE, TYPE MV	90382	Mg	
RECYCLED ASPHALTIC SURFACE, TYPE LV	90383	Mg	
CONCRETE PAVEMENT, 150 mm	41506	sm	$13.50
CONCRETE PAVEMENT, 175 mm	41507	sm	$18.00
CONCRETE PAVEMENT, 200 mm	41508	sm	$18.00
CONCRETE PAVEMENT, 225 mm	41509	sm	$20.25
CONCRETE PAVEMENT, 250 mm	41510	sm	
CONCRETE PAVEMENT, 275 mm	41511	sm	
CONCRETE PAVEMENT, 300 mm	41512	sm	
CONCRETE WIDENING	41530	sm	
CONTINUOUS CONCRETE PAV'T REINFORCEMENT	41551	sm	
PAVEMENT TIES	41571	EACH	$5.00
DOWEL BARS	41572	EACH	$5.00
CRUSHED AGGREGATE BASE COURSE	30404	Mg	$7.75
OPEN GRADED BASE COURSE #1	30418	Mg	$9.00
OPEN GRADED BASE COURSE #2	30420	Mg	$9.00
ASPHALTIC BASE COURSE	30601	Mg	
ASPHALTIC BASE COURSE WIDENING	30606	Mg	
CONCRETE BASE COURSE	30706–9	sm	
CONCRETE BASE COURSE WIDENING	30751	sm	
BREAKER RUN	30426	Mg	$7.00
GRANULAR SUBBASE COURSE	21201	cm	$3.30
MILL AND RELAY ASPHALTIC CONCRETE PAVEMENT		sm	$0.86
SALVAGED ASPHALTIC PAVEMENT	41010	Mg	
SALVAGED ASPHALTIC PAVEMENT, MILLING	41020	Mg	$7.72
ASPHALTIC SURFACE, PATCHING	41102	Mg	
PULVERIZING ASPHALTIC CONCRETE PAVEMENT		sm	$0.70
BASE PATCHING, ASPHALTIC	30810	sm	
BASE PATCHING, CONCRETE	30820	sm	$40.95
CRACKING AND SEATING CONCRETE PAVEMENT	41040	sm	
BREAKING AND SEATING CONCRETE PAVEMENT		sm	
CONCRETE PAVEMENT REPAIR	41574	cm	$183.00
CONTINUOUS DIAMOND GRINDING	41576	sm	$2.69
RUBBLIZING CONCRETE PAVEMENT		sm	
CONCRETE CURB & GUTTER, 750 mm, TYPE A	60123	m	
CONCRETE CURB & GUTTER, 750 mm, TYPE D	60133	m	
GEOTEXTILE FABRIC, TYPE DF	64503	sm	$1.20
PIPE UNDERDRAIN, 150 mm	61201	m	$4.43
PIPE UNDERDRAIN, UNPERFORATED, 150 mm	61211	m	$22.15
R.C. APRON ENDWALLS FOR UNDERDRAIN	61254	EACH	$125.00
REMOVING PAVEMENT	20401	sm	
GEO–GRID	'90xxx	sm	$1.75

ALTERNATE DESCRIPTION WORKSHEET

Version 3.3

07/13/98

8600-02-01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

PARAMETER	UNITS	ALT 1 VALUE	ALT 2 VALUE	ALT 3 VALUE	ALT 4 VALUE	ALT 5 VALUE	ALT 6 VALUE
RURAL OR URBAN PROJECT	R/U	r	r	r			
ROADWAY WIDTH	m	10.80	10.80	10.80			
PAVEMENT STRUCTURE WIDTH	m	7.20	7.20	7.20			
TOTAL PAVED SHOULDER WIDTH	m	1.80	1.80	1.80			
CONCRETE RDWY PAVEMENT THICKNESS	mm	175					
CONCRETE SHOULDER THICKNESS	mm	175					
AC RDWY PAVEMENT MIX TYPE	HV/MV/LV		MV	MV			
TOTAL AC RDWY PAVEMENT THICKNESS	mm		125	140	125		
VIRGIN AC RDWY PAVEMENT THICKNESS	mm		125	140			
% OF ASPHALT CEMENT USED	%		6.0	6.0			
RECYCLED AC RDWY PAVEMENT THICKNESS	mm						
% OF ASPHALT CEMENT USED	%						
% RAP	%						
AC SHOULDER PAVEMENT MIX TYPE	HV/MV/LV		MV	mv			
TOTAL AC SHOULDER PAVEMENT THICKNESS	mm		125	140			
VIRGIN AC SHOULDER THICKNESS	mm		125	140			
RECYCLED AC SHOULDER THICKNESS	mm						
% OF ASPHALT CEMENT USED	%		6.0	6.0			
ASPHALTIC CONCRETE PAVEMENT WT.	kg/sm/mm	2.35	2.35	2.35	2.35	2.35	2.35
TACK COAT COVERAGE	L/sm	0.113	0.113	0.113	0.113	0.113	0.113
WHICH LAYER IS THE DRAINAGE LAYER?	0–4	0	0	0	0	0	0
CRUSHED AGG. BASE COURSE THICKNESS	mm	150.00	275.00	300.00	0		
UNIT WT OF CABC	Mg/cm	2.4	2.4	2.4			
OPEN GRADED BASE COURSE #1 THICKNESS	mm		0	0	0		
UNIT WT OF OGBC #1	Mg/cm						
OPEN GRADED BASE COURSE #2 THICKNESS	mm			0	0		
UNIT WT OF OGBC #2	Mg/cm						
BREAKER RUN THICKNESS	mm		0	0	0		
UNIT WT OF BREAKER RUN	Mg/cm						
ASPHALTIC STABILIZED B.C. THICKNESS	mm						
% OF ASPHALTIC CEMENT USED	%						
UNIT WT OF AC STABILIZED BASE COURSE	Mg/cm						
P.C. STABILIZED BASE COURSE THICKNESS	mm						
UNIT WT OF PCC STABILIZED BASE COURSE	Mg/cm						
GRANULAR SUBBASE COURSE THICKNESS	mm	275	275	0	0		
OTHER #1 (STRUCTURE WIDTH)	mm						
	Mg/cm						
OTHER #2 (ROADWAY WIDTH)	mm						
	Mg/cm						
EXISTING PAVEMENT WIDTH	m		6.70	6.70			
EXISTING PAVEMENT THICKNESS	mm						
% OF PROJECT LENGTH FOR CURB & GUTTER	%						
TYPE OF CURB & GUTTER	A/D						
% OF PROJECT LENGTH FOR GEOTEXTILE FABRIC	%						
% OF PROJECT LENGTH FOR UNDERDRAINS	%						
% OF PROJECT LENGTH FOR TACK COATING	%		66	66			
TOTAL m2 OF CRCP STEEL REINFORCEMENT	sm						
%OF PROJECT LENGTH FOR MILL & RELAY AC PAV'T	%						
%OF PROJECT PAV'T AREA FOR AC SURF PATCHING	%						
%OF PROJECT LENGTH FOR PULVERIZING AC PAV'T	%						
MILLING DEPTH	mm						
%OF PROJECT LENGTH FOR SALV AC PAV'T MILLING	%						
%OF PROJECT LENGTH FOR SALV AC PAV'T	%						
%OF PROJECT LENGTH FOR DIAMOND GRINDING	%						
%OF PROJECT LENGTH FOR PCC PAV'T REPAIR	%						
#OF PAV'T TIES PER METER OF LONGIT. LENGTH	EACH						
#DOWELS PER PATCH JOINT	EACH						
AVG. LENGTH OF PCC PATCH	m						
%OF PROJECT LENGTH FOR CRACK & SEAT	%						
%OF PROJECT LENGTH FOR BREAK & SEAT	%						
%OF PROJECT LENGTH FOR RUBBLIZING	%						
TOTAL AREA FOR ASPHALTIC BASE PATCHING	sm						
TOTAL AREA FOR CONCRETE BASE PATCHING	sm						
TOTAL AREA FOR CONCRETE WIDENING	sm						
TOTAL AREA FOR AC BASE COURSE WIDENING	sm						
TOTAL AREA FOR PCC BASE COURSE WIDENING	sm						
%OF PROJECT LENGTH FOR PAVEMENT REMOVAL	%						

BASE LAYER: (FOR QUANTITY CALCULATIONS)

X – NONE
A – CABC
B – OGBC #1
C – OGBC #2
D – BREAKER RUN
E – AC STABILIZED
F – PC STABILIZED
G – GRANULAR
H – OTHER #1
I – OTHER #2

	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 6
LAYER 1	a	a	a	x	x	x
LAYER 2	g	g	x	x	x	x
LAYER 3	X	X	X	X	X	X
LAYER 4	X	X	X	X	X	X

ALTERNATE QUANTITIES AND COSTS

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Chippewa

PARAMETER	UNITS	ALTERNATIVE #1 PCC		ALTERNATE #2 Asphalt/base/sand		ALTERNATE #3 Asphalt/base	
		QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
CONCRETE PAVEMENT (RDWY)	sm	7,200.0	$129,600.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT (SHOULDERS)	sm	1,800.0	$32,400.00	0.0	$0.00	0.0	$0.00
VIRGIN AC PAVEMENT (RDWY)	Mg	0.0	$0.00	2,115.0	$34,897.50	2,368.8	$39,085.20
VIRGIN AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	528.8	$8,724.38	592.2	$9,771.30
RECYCLED AC PAVEMENT (RDWY)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
RECYCLED AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALT CEMENT	Mg	0.0	$0.00	158.6	$24,586.88	177.7	$27,537.30
CRUSHED AGG. BASE COURSE	Mg	5,658.0	$43,849.50	9,204.0	$71,331.00	10,239.4	$79,355.04
OPEN GRADED BASE COURSE #1	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
OPEN GRADED BASE COURSE #2	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAKER RUN	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
GRANULAR SUBBASE COURSE	cm	3,987.5	$13,158.75	4,152.5	$13,703.25	0.0	$0.00
CURB & GUTTER	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
TYPE DF GEOTEXTILE FABRIC	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
150 mm PIPE UNDERDRAINS	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
150mm PIPE UNDERDRAINS,UNPERFORATED	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
APRON ENDWALLS FOR UNDERDRAINS	EACH	0	$0.00	0	$0.00	0	$0.00
TACK COATING	L	0.0	$0.00	2,013.7	$2,013.66	2,013.7	$2,013.66
MILL & RELAY AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT,MILLING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC SURFACE PATCHING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
PULVERIZING AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONTINUOUS DIAMOND GRINDING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT REPAIR	cm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CRCP REINFORCEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
PAVEMENT TIES	EACH	0	$0.00	0	$0.00	0	$0.00
DOWEL BARS	EACH	0	$0.00	0	$0.00	0	$0.00
CRACK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
RUBBLIZING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE WIDENING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
REMOVING PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
Cost Adjustment - see comps							
OTHER BASE #1	Mg	0.0		0.0		0.0	
OTHER BASE #2	Mg	0.0		0.0		0.0	
ALTERNATIVE TOTAL			$219,008.25		$155,256.66		$157,762.50

ALTERNATE QUANTITIES AND COSTS

PARAMETER	UNITS	ALTERNATE #4 Existing Structure		ALTERNATE #5 0		ALTERNATE #6 0	
		QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
CONCRETE PAVEMENT (RDWY)	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT (SHOULDERS)	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
VIRGIN AC PAVEMENT (RDWY)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
VIRGIN AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
RECYCLED AC PAVEMENT (RDWY)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
RECYCLED AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALT CEMENT	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CRUSHED AGG. BASE COURSE	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
OPEN GRADED BASE COURSE #1	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
OPEN GRADED BASE COURSE #2	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAKER RUN	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE	cm	0.0	$0.00	0.0	$0.00	0.0	$0.00
GRANULAR SUBBASE COURSE	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
CURB & GUTTER	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
TYPE DF GEOTEXTILE FABRIC	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
150 mm PIPE UNDERDRAINS	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
150mm PIPE UNDERDRAINS,UNPERFORATED	EACH	0	$0.00	0	$0.00	0	$0.00
APRON ENDWALLS FOR UNDERDRAINS	L	0.0	$0.00	0.0	$0.00	0.0	$0.00
TACK COATING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
MILL & RELAY AC PAVEMENT	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT,MILLING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC SURFACE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
PULVERIZING AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONTINUOUS DIAMOND GRINDING	cm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT REPAIR	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CRCP REINFORCEMENT	EACH	0	$0.00	0	$0.00	0	$0.00
PAVEMENT TIES	EACH	0	$0.00	0	$0.00	0	$0.00
DOWEL BARS	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CRACK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
RUBBLIZING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE WIDENING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
REMOVING PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
Cost Adjustment--see comps							
OTHER BASE #1	Mg	0.0		0.0		0.0	
OTHER BASE #2	Mg	0.0		0.0		0.0	
ALTERNATIVE TOTAL			$0.00		$0.00		$0.00

ALTERNATE MAINTENANCE

Version 3.3

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MAINTENANCE COSTS: (CURRENT YEAR)

ALTERNATE TITLE	INCREMENT 1		INCREMENT 2		INCREMENT 3		INCREMENT 4		INCREMENT 5	
	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR
PCC	12	13	17	18	24	25	27	28	33	34
YEARLY COST	$2,400.00		$4,970.00		$4,970.00		$4,970.00		$1,250.00	
Asphalt/base/sand	2	3	9	10	16	17	22	23	28	29
YEARLY COST	$1,250.00		$1,550.00		$1,250.00		$1,550.00		$1,250.00	
Asphalt/base	2	3	9	10	16	17	22	23	28	29
YEARLY COST	$1,250.00		$1,550.00		$1,250.00		$1,550.00		$1,250.00	
Existing Structure										
YEARLY COST										
0										
YEARLY COST										
0										
YEARLY COST										

MAINTENANCE COSTS: (CURRENT YEAR)

ALTERNATE TITLE	INCREMENT 6		INCREMENT 7		INCREMENT 8		INCREMENT 9		INCREMENT 10	
	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR
PCC	37	38	43	44	47	48				
YEARLY COST	$1,550.00		$1,250.00		$1,550.00					
Asphalt/base/sand	34	35	40	41	47	48				
YEARLY COST	$1,550.00		$1,250.00		$1,550.00					
Asphalt/base	34	35	40	41	47	48				
YEARLY COST	$1,550.00		$1,250.00		$1,550.00					
Existing Structure										
YEARLY COST										
0										
YEARLY COST										
0										
YEARLY COST										

ALTERNATE REHABILITATION

Version 3.3

07/13/98

8600-02-01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

ASPHALT PAVEMENT REHABILITATION SCHEMES:

SCHEME	Mill / Overlay Limits 1: RDWY ONLY 2:RDWY & Shoulders	MILLING DEPTH (mm)	% OF PROJECT for SURF. PATCHING	OVERLAY THICKNESS (mm)	MIX TYPE (HV,MV,LV)	% AC in OVERLAY MIX	OTHER COSTS	OTHER COST DESCRIPTION
AC1	2	0	0.0	75	mv	6.0		
AC2	2	25	0.0	90	mv	6.0		
AC3	2	50	0.0	100	mv	6.0		Similar costs to mill&relay and new asphalt
AC4								
AC5								
AC6								
AC7								
AC8								
AC9	RECONSTRUCT: USING ORIGINAL AC LAYER THICKNESSES							

CONCRETE PAVEMENT REHABILITATION SCHEMES:

Repair – Grind SCHEMES	% PCC REPAIR	AVG PATCH LENGTH in m	# DOWELS PER JOINT	% OF PROJECT for PCC Base Patching		OTHER COSTS	OTHER COST DESCRIPTION
PC1	0.0	1.8	32	0.0	& Continuous Grind		
PC2	0.0	1.8	32	1.0	& Continuous Grind		
PC3					& Continuous Grind		

Repair – Overlay SCHEMES	% PCC REPAIR	AVG PATCH LENGTH in m	# DOWELS PER JOINT	% OF PROJECT for PCC Base Patching	% OF PROJECT for AC Base Patching	OVERLAY THICKNESS (mm)	MIX TYPE (HV,MV,LV)	% AC in OVERLAY MIX	OVERLAY LIMITS 1: RDWY ONLY 2: RDWY & Shoulders	OTHER COSTS	OTHER COST DESCRIPTION
PC4	0.0	1.8	12	5.0	0.0	0		6.0	2		
PC5	0.0	1.8	12	5.0	0.0	75	mv	6.0	2		
PC6											

Mill – Repair – Overlay SCHEMES	Mill / Overlay Limits 1: RDWY ONLY 2:RDWY & Shoulders	MILLING DEPTH (mm)	% PCC REPAIR	AVG PATCH LENGTH in m	# DOWELS PER JOINT	% OF PROJECT for PCC Base Patching	% OF PROJECT for AC Base Patching	OVERLAY THICKNESS (mm)	MIX TYPE (HV,MV,LV)	% AC in OVERLAY MIX	OTHER COSTS
PC7	2	75	0.0	1.8	12	2.0	0.0	75	mv	6.0	
PC8											
PC9											

PC7 OTHER COST DESCRIPTION	
PC8 OTHER COST DESCRIPTION	
PC9 OTHER COST DESCRIPTION	

SCHEME		OTHER COSTS	OTHER COST DESCRIPTION
PC10	CONTINUOUS DIAMOND GRIND ONLY		
PC11	RECONSTRUCT: USING ORIGINAL PCC LAYER THICKNESSES		

ALTERNATE REHABILITATION SCENARIOS:

REHABILITATION COSTS (COSTS ARE CURRENT YEAR)	ALT. #1: PCC			ALT. #2: Asphalt/base/sand			ALT. #3: Asphalt/base			ALT. #4: Existing Structure		
	SPACING	TYPE	CURRENT YR COST	SPACING	TYPE	CURRENT YR COST	SPACING	TYPE	CURRENT YR COST	SPACING	TYPE	CURRENT YR COST
FIRST REHABILITATION	20	PC4	$14,742.00	14	AC2	$57,402.45	14	AC2	$57,402.45			$0.00
SECOND REHABILITATION	10	PC5	$60,212.25	12	AC3	$65,438.90	12	AC3	$65,438.90			$0.00
THIRD REHABILITATION	10	PC7	$61,101.90	12	AC9	$70,222.41	12	AC9	$78,407.46			$0.00
FOURTH REHABILITATION			$0.00			$0.00			$0.00			$0.00
FIFTH REHABILITATION			$0.00			$0.00			$0.00			$0.00
EXPECTED LIFE OF LAST REHABILITATION	10			14			14			0		
TOTAL LIFE	50			52			52					

LIFE CYCLE COST ANALYSIS

Version 3.3

07/13/98

8600-02-01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

CURRENT YEAR	1998	DISCOUNT RATE (%)	5.0
CONSTRUCTION YEAR	2002	PROJECT LENGTH (Km)	1.00
DESIGN YEAR	2022	ANALYSIS BASIS (P/M)	M
ANALYSIS PERIOD	50.0		

	ALT. 1	ALT. 2	ALT. 3	ALT. 4	ALT.5	ALT. 6
TERMINAL SALVAGE VALUE						

PRESENT WORTH COSTS: (CURRENT YEAR)

	ALT. 1 PCC	ALT. 2 Asphalt/base/sand	ALT. 3 Asphalt/base	ALT. 4 Existing Structure	ALT.5 0	ALT. 6 0
INITIAL CONSTRUCTION COSTS	$180,178.63	$127,730.04	$129,791.60	$0.00	$0.00	$0.00
REHABILITATION COSTS	$23,173.16	$48,271.80	$49,326.35	$0.00	$0.00	$0.00
MAINTENANCE COSTS	$5,916.56	$3,441.68	$3,441.68	$0.00	$0.00	$0.00
TERMINAL SALVAGE VALE	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
REHABILITATION SALVAGE VALUE	$0.00	($1,292.49)	($1,443.14)	$0.00	$0.00	$0.00
TOTAL FACILITY COSTS	$209,268.35	$178,151.02	$181,116.49	$0.00	$0.00	$0.00

EQUIVALENT UNIFORM ANNUAL COSTS: (OVER ANALYSIS PERIOD)

	ALT. 1 PCC	ALT. 2 Asphalt/base/sand	ALT. 3 Asphalt/base	ALT. 4 Existing Structure	ALT.5 0	ALT. 6 0
INITIAL CONSTRUCTION COSTS	$9,869.60	$6,996.63	$7,109.56	$0.00	$0.00	$0.00
REHABILITATION COSTS	$1,269.35	$2,644.17	$2,701.94	$0.00	$0.00	$0.00
MAINTENANCE COSTS	$324.09	$188.52	$188.52	$0.00	$0.00	$0.00
TERMINAL SALVAGE VALE	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
REHABILITATION SALVAGE VALUE	$0.00	($70.80)	($79.05)	$0.00	$0.00	$0.00
TOTAL FACILITY COSTS	$11,463.04	$9,758.53	$9,920.97	$0.00	$0.00	$0.00

7/14/98
06:26:33

WISCONSIN DEPARTMENT OF TRANSPORTATION
PAVEMENT INDEX FILE SYSTEM
BROWSE OF CURRENT PDI & PSI VALUES

IPFMBC

District 6 County Name CHIPPEWA County Number 9 Highway 178N

Enter S in Opt Field to View Section Data

Opt	From RP	+	Distance	From Feature	To RP	+	Distance	*Current* Surface Yr	Ty	*PDI* Survey Yr	No.	*IRI* Survey Yr	mm/m
	011G	+	0.000	CTH. Y	012K	+	0.000	85	1	96	28	97	1.83
	012K	+	0.000	182ND. ST.	014G	+	0.000	85	1	96	49	97	1.40
	014G	+	0.000	CTH Y INT	015	+	0.000	81	1	96	57	97	2.38
	015	+	0.000	FINLEY LAKE RD	015	+	0.980	81	1	96	76	97	3.08
	015	+	0.980	160TH AVE.	017	+	0.000	87	1	96	34	97	2.75
	017	+	0.000	210TH ST.	018	+	0.000	79	1	96	70	97	3.50
	018	+	0.000	215TH ST.	018	+	0.680	88	1	96	31	97	2.46
	018	+	0.680	SECTION 9 & 10	020	+	0.000	84	1	96	50	97	2.86
	020	+	0.000	180TH AVE	022	+	0.000	88	1	96	41	97	2.97
	022	+	0.000	190TH AVE.	023	+	0.000	83	2	96	75	97	3.58

Surf Type 1=ACPM/FB,2=BRM, 3=ACPM/RB, 4=JRCP, 5=JPCP w/o d, 6=CRCP, 8=JPCP /d

SELECT DATA TO VIEW, OR PRESS ENTER FOR MORE
ENTER TO CONTINUE PF3 OR PF15 TO BROWSE MENU PA2 TO CANCE
PF2 OR PF14 TO PRIMARY MENU PF12 OR PF24 TO LOGOFF CICS

7/14/98
06:26:41

WISCONSIN DEPARTMENT OF TRANSPORTATION
PAVEMENT INDEX FILE SYSTEM
BROWSE OF CURRENT PDI & PSI VALUES

IPFMBC

District 6 County Name CHIPPEWA County Number 9 Highway 178N

Enter S in Opt Field to View Section Data

Opt	From RP	+	Distance	From Feature	To RP	+	Distance	*Current* Surface Yr	Ty	*PDI* Survey Yr	No.	*IRI* Survey Yr	mm/m
	022	+	0.000	190TH AVE.	023	+	0.000	83	2	96	75	97	3.58
	023	+	0.000	CTH R INT	024	+	0.000	87	1	96	38	97	2.60
	024	+	0.000	CTH ZZ INT	024	+	1.250	81	1	96	24	97	2.45
	024	+	1.250	SECTION 25 & 24	027	+	0.000	84	1	96	66	97	2.57
	027	+	0.000	STH 64E	499E	+	0.000						
		+				+							
		+				+							
		+				+							
		+				+							
		+				+							

Surf Type 1=ACPM/FB,2=BRM, 3=ACPM/RB, 4=JRCP, 5=JPCP w/o d, 6=CRCP, 8=JPCP /d

NO MORE SECTIONS FOR COUNTY & HIGHWAY
ENTER TO CONTINUE PF3 OR PF15 TO BROWSE MENU PA2 TO CANCE
PF2 OR PF14 TO PRIMARY MENU PF12 OR PF24 TO LOGOFF CICS

CORRESPONDENCE/MEMORANDUM State of Wisconsin

Date: July 13, 1998

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: Traffic Forecast projection revisions
Project 8600-02-01

This project has been in and out of the six year program for the last 5-10 years. There has been no recent specific traffic forecast done for this segment. For structural design purposes, I chose to use a construction year ADT of 2000 and a 20 year ADT of 2400. The truck percentage was rounded to 8%. The following two forecasts done in 1992 and 1995 give volumes for the roadway but are outdated.

TRAFFIC FORECAST

PROJECT ID: 8600–02–71
COUNTY: Chippewa
ROUTE: STH 178
LOCATION: Int. w/ CTH Y to Int. w/ STH 64

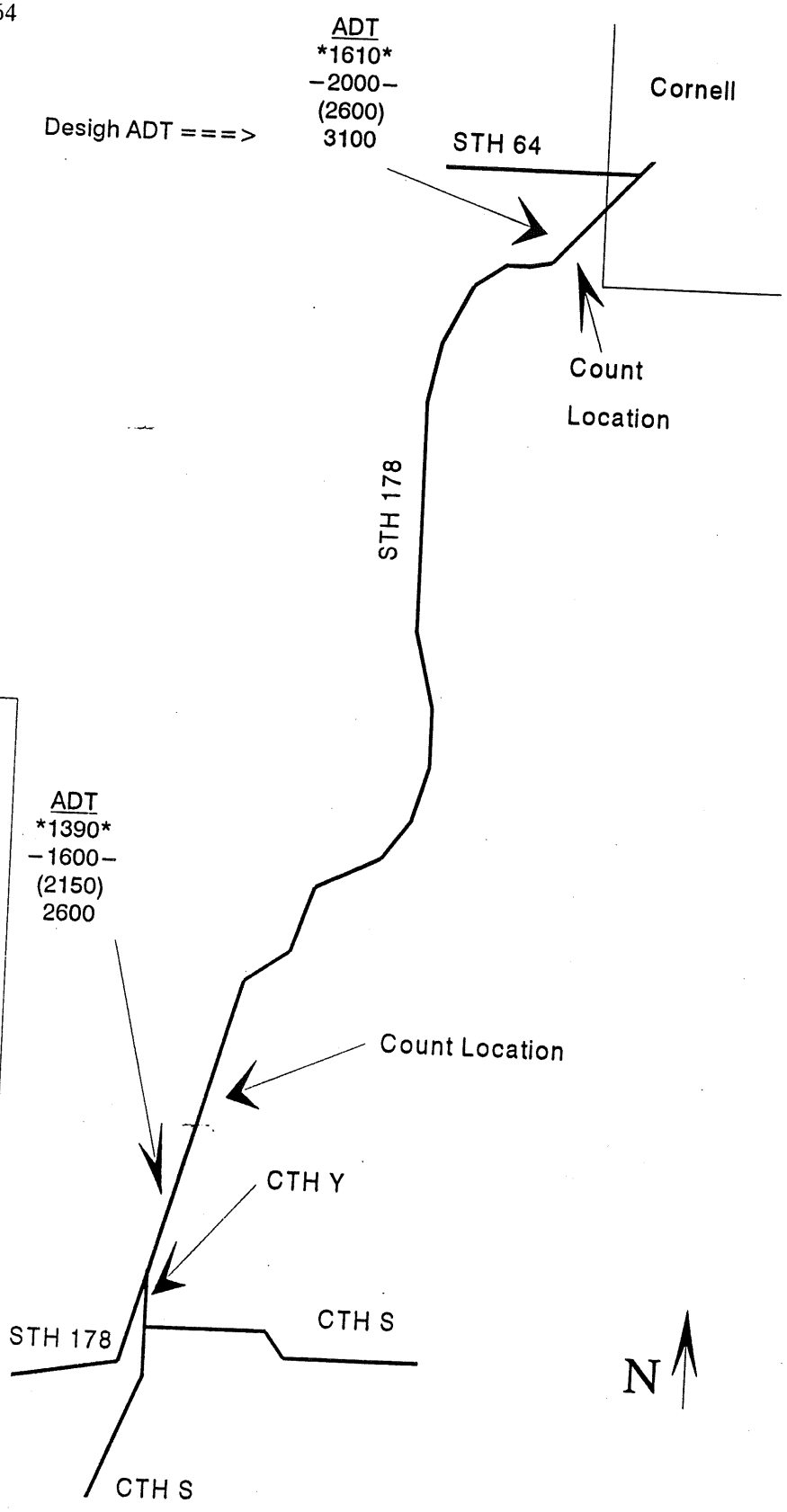
KEY	
000	1991 Traffic Count
–000–	1994 Forecast
(000)	2004 Forecast
000	2014 Forecast

DESIGN VALUES	
K100	11.6
K50	12.4
K30	13.1
P(PHV)	16.9
T(DHV)	6.2
T(PHV)	3.5
D	60/40
K8(ADT)	--
T(A8HV)	--

TRUCK CLASS	
TRUCK TYPE	% ADT
2D	3.6
3AX	1.4
2S1+2S2	0.7
3–S2	2.0
DBL–BTM	0.0
TOTAL	7.7

NOTES ON THE ANALYSIS:

1. The functional classification of STH 178 over the project section is COLLECTOR; the seasonal adjustment factor group for the section is group 4.
2. In developing this forecast, it was assumed that no new major traffic generators will be developed in the vicinity of the project section over the course of the forecast period.
4. In developing the forecast for the southern site, the the historical traffic count for 1975 was excluded from the analysis because it departed substantially from the trend in the other historical counts.
5. Truck percentages of ADT were obtained from a table of vehicle type percentages by functional class and urban/rural area because a vehicle type counter is not located on STH 178.
6. Design parameters are calculated using the design year ADT for the northern most forecast location (3100).

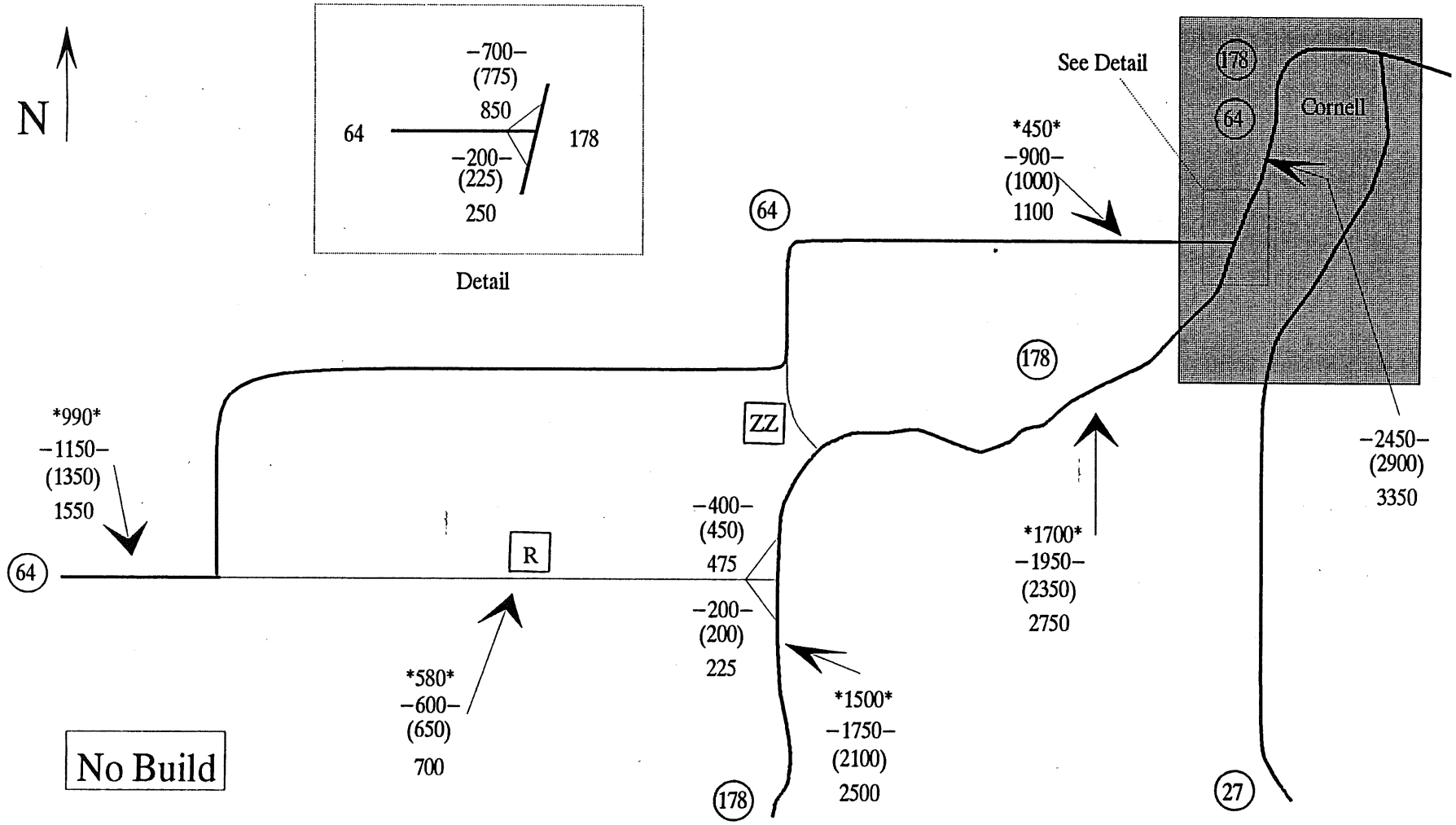


Developed by Keith Wendt, Traffic Forecasting and Analysis Section 14–Sep–92

PROJECT ID: 8191–01–01
COUNTY: Chippewa
ROUTE: STH 64
LOCATION: STH 64: CTH R to STH27
DISTRICT: 6

KEY	
000	1993 ADT
–000–	1999 ADT
(000)	2009 ADT
000	2019 ADT

Developed by Scott Erdman, Traffic Analysis & Forecasting Sect.; Phone: (608) 266–1010;
E–Mail ID: ERDMAS
Completed: 26–Jul–95



DESIGN VALUES	
K100	11.5
K50	12.3
K30	12.9
P(PHV)	16.7
T(DHV)	6.2
T(PHV)	3.5
D	60/40
K8(ADT)	NA
T(A8HV)	NA

TRUCK CLASS	
TRUCK TYPE	% ADT
2D	3.6
3AX	1.4
2S1+2S2	0.7
3–S2	2.0
Dbl–Btm	0.0
TOTAL	7.7

Notes on the Forecast:

1. Historic and projected traffic volumes represent Axle – Adjusted AADT. Pre – 1990 counts are factored using indicated Axle – Adjustment Factors (A–AF).
2. This forecast assumes that no signficant new traffic generators will be developed in the project area during the forecast period.
3. STH 64 has an axle – adjustment factor of .93 and is in Factor Group 4, indicating moderate seasonal traffic fluctuation.

REFERENCES

1. "Wisconsin Highway Traffic", available coverage counts, 1975 – 1993.
2. "Official Poulation Estimates, Demographic Services Center, DOA.

CONCEPT DEFINITION REPORT

Date: 07/17/96 To: Michael A. Cass (P.E.) From: District 6

I. Design ID: 8600-02-01 Related ID(s): 8600-02-71(Const)
Highway No. or Local Road Name: STH 178 8600-02-21 (R/W)
Title: CHIPPEWA FALLS - CORNELL ROAD
County: CHIPPEWA Length: 7.4 Miles 11.9 km
Functional Class: Major Collector Current ADT: 1650 (1993)
LOCATION: CTH Y - CTH R

II. A. Roadway Conditions:
Pavement: Type: AC Width: 22 Year: 1981
PSI: 2.69 (1993) PDI: 30 (1994)
Shoulder: Type: Gravel Width: 2
Accident Rate: 480 Year: 1995
Substandard Alignment: Horizontal: Yes Vertical: Yes

B. Structure: (may be continued on back side)
Type: DECK GIRDER Length: 86.5 ft, 26.4 m
Bridge Number: B-09-0682 Year Constructed: 1942
Clear Roadway Width: 27.6 SR: 80.5 RS: 89.4

JUSTIFICATION: Accident rate is 480 vs State ave of 222 because of narrow shoulders, sharp horiz curvature and short vertical and horiz sight distance. There are many power poles and trees in clear zone.

III. PROPOSED IMPROVEMENT: Grade, Base, Asphaltic Surface to C3 standards with a 24 ft surface on a 36 ft roadway with a 30 ft clear zone.

A. Environmental documentation type: III ER
B. Improvement Type: RECST PMSID: 98060020201
C. Cost: $ 3,850,000 Program Year: 2002 Program: 3334
D. Local Participation: $ No Access Control: No

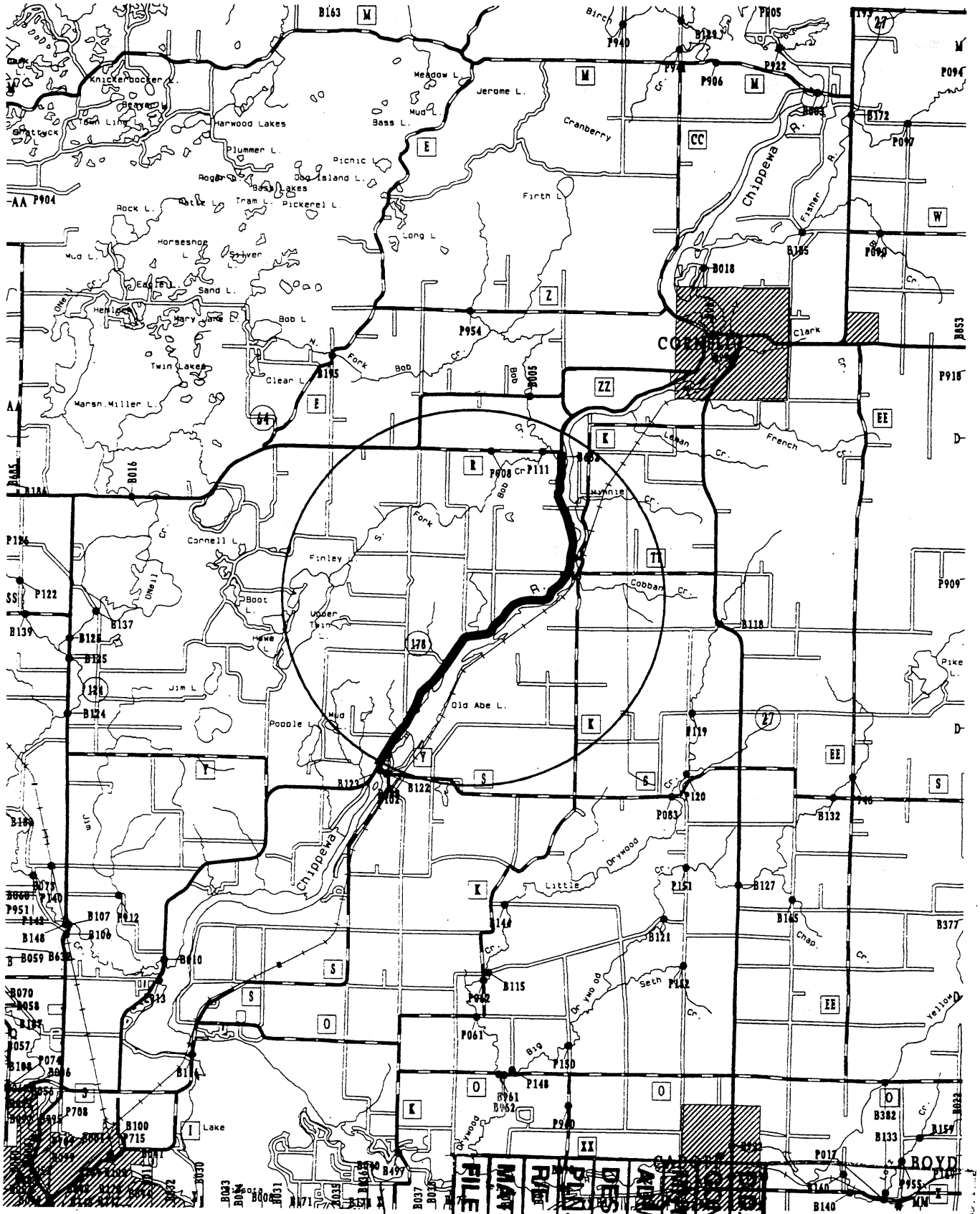
==========

DISTRICT 6 APPROVAL

Project Supervisor — Date: 7-17-96

Planning Supervisor — Date: 17 Jul 96

CC: Gerry Feiler - Rm 951, Len Stanek - Rm 651, Bureau of Environment - Rm 451
Gene Hoelker - FHWA
District 6 Geographic Information System



CHIPPEWA COUNTY
PROJECT ID 8600-02-71

CORRESPONDENCE/MEMORANDUM State of Wisconsin
DISTRICT #6

Date: July 16, 1998

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: **PAVEMENT DESIGN REPORT**
Approval Letter

Project I.D. 8600-02-01
Chippewa Falls - Cornell Road
Jim Falls - CTH R
STH 178
Chippewa County

Upon review of the attached pavement design documentation, the pavement type selection recommendations are approved for the above mentioned project segments.

Reviewed: COMMENTS

Richard J. Shermo, P.E. Date
District #6 Area Supv.-Project Development Section

Approved: COMMENTS

Michael S. Ostrowski, P.E. Date
District #6 Manager-Project Development Section

State of Wisconsin
Transportation District #6

CORRESPONDENCE/MEMORANDUM

Date: July 16, 1998

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: Pavement Design Report
Project 8600-02-01
Chippewa Falls - Cornell
Jim Falls - CTH R
STH 178
Chippewa County

EXECUTIVE SUMMARY

This report makes the following recommendations for the proposed reconstruction project.

LOCATION	PAVEMENT STRUCTURE	THICKNESS
STH 178-mainline & bypass lanes	Asphalt/ Base Course/ Sand Lift	125mm/275mm/275mm (5") /(11") /(11")
Side Roads >500 ADT	Asphalt/ Base Course	100mm/300mm (4") /(12")
Side Roads <500 ADT	Asphalt/Base Course	75mm /225mm (3") /(9")

Type MV Asphaltic Concrete Pavement mix with PG grade 58-28 should be used for this project. It is anticipated that by the time this plan is let to bid, a different PG graded oil could be the standard. The designer should coordinate the special provisions to reflect the correct AC type.

The 125mm(5") asphalt pavement should be constructed with two lower layers totaling 85mm(3 ½") and a upper layer of 40mm(1 ½"). The 100mm(4") asphalt pavement should be constructed with a 50mm(2") lower layer and a 50mm(2") upper layer. The 75mm(3") asphalt pavement should be constructed with two layers.

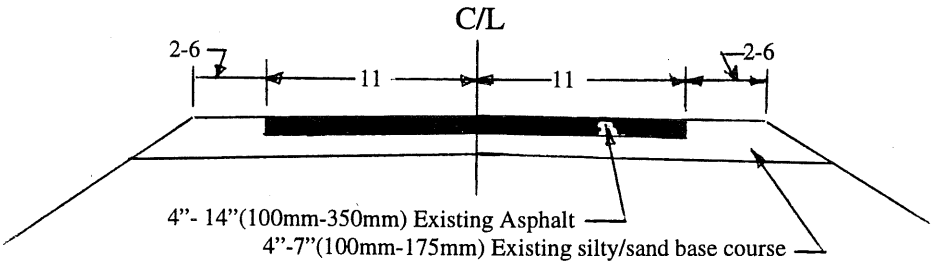
The sand lift should be specified to meet Grade #1 requirements as specified in the Standard Specifications Section 209.2.2 for granular backfill.

EXISTING CONDITIONS

This 11.9km(7.4 mile) project involves the portion of STH 178 from the intersection of CTH Y at Jim Falls northerly along the Chippewa River to the intersection of CTH R. Due to a high accident rate, as stated in the CDR, the roadway will be reconstructed to C3 standards. This roadway is not being reconstructed due to excessive pavement failures or deficiencies. It appears that the roadway was last resurfaced in 1981 with a maintenance type overlay. The 1996 PDI ranged from 28-75 for this section. The 1997 IRI ranged from 1.4-3.6.

In 1993, the roadway core was investigated for a resurfacing type project. Since that time, the concept was revised to a reconstruct type improvement. The 1993 borings are located in the technical services project records.

EXISTING TYPICAL



TRAFFIC PROJECTIONS

The construction year- 0 year ADT is 2000 and the 20 year ADT is projected to be 2400.

Truck percentages are as follows:

TRUCK TYPE	%
2D	3.6
3AX	1.3
2SI,2S2	0.8
3-S2	2.3
DBL.BTM	0.0
TOTAL	8.0

PROPOSED IMPROVEMENT

This project is currently scheduled for a reconstruct(RECST) type improvement. The existing roadway will be reconstructed to C3 standards which will include adjustments to the horizontal and vertical alignments.

SOIL ENGINEERING FACTORS

Over the length of this project, many different soil series are located under the roadway. The roadway core itself, as revealed in the 1993 roadway borings, has various amounts of silt and topsoil present along with some granular material in some of the fill locations. With the existing roadway material varying from moist to wet, construction could be a problem. With the existing silty materials in mind, it was agreed to with the Soils Engineer- Lary Hyland that a sand lift would be the best choice in this situation. For further discussion see the "alternative evaluated section". The DGI recommended for this roadway is 14 with a soil support value of 4.0. At the time of this report, due to the uncertainty of the horizontal and vertical alignment only a preliminary soils analysis has been completed.

FRICTION CHARACTERISTICS

The aggregate is expected to be igneous with 0% dolomite and a 20% L.A. wear resulting in a friction number of 44 and 51 for the PCC. Friction is not expected to be a problem.

ALTERNATIVES EVALUATED and RECOMMENDATIONS

Alternative Discussion

Initially, this segment of roadway was scheduled for a maintenance type overlay in 1998. That project was scrapped and the roadway segment is now being evaluated as a reconstruct to C3(100KM/60MPH) standards. In January 1997, the project was explained to me as a typical shoulder widening project on the south end with some short segments of relocation from the middle of the project northward to CTH R. Since that time, evaluation by the development staff has led to a concept of a total reconstruction.

I have numerous concerns that need to be addressed. The horizontal alignment, provided at the time of this report, continually drifts on and off the centerline of the existing road core in a range of 0-8 feet(0-2.5m). We have had past mid lane failures in minor grading areas when part of the old core supports the new lane and new material is added adjacent to support the remaining lane. Besides the obvious heave potential of the different materials, differential settlement occurs in the new material due to different compaction levels of the new material versus the old road core. As shown on the plan sheets and preliminary sections, in many cases, the subgrade point is being moved out over wet silty marshy material in the old ditches. Also in many locations, water is within 2-3 feet of the pavement surface. At this point in the design process, I can only assume that the designer will follow through with his/her responsibility to provide information to and coordinate with the district Soils Engineer to identify and treat these problem areas once the final horizontal and vertical alignment is chosen. In past situations of widening over old ditches, these areas have either been excavated and back-filled or a grid/back-fill combination was used. The high water table is a separate issue, as obviously it is hard to construct a stable subgrade within 1-2 feet of the existing water elevation. There is a reasonable chance that the asphalt/base/sand lift pavement will not perform in this situation . The designer should remember that a sand lift or breaker run platform will typically push the subgrade to 2 feet or greater below the finished profile.

Alternative Discussion-cont.

On other projects/roadways of this type, past experience had led to a district sequence of operations where the horizontal alignment is left in place and the shoulders are widened and raised to the existing profile. If a sag vertical deficiency exists in this area we will typically gravel lift up to a foot to improve the profile. Crest and sag verticals are routinely excepted to standards of 40 mph if there is no accident history at that location. After the widening or lifting is completed the traveled way surface is addressed with some type of overlay or mill/pulverize & relay and overlay combination, always taking care to remain in the middle of the old roadway core. We typically do experience some shoulder distortion but it is not critical to the performance of the pavement. Besides achieving pavement performance, this operation also has the benefit of providing adequate local access because, typically 2 lane traffic can be provided in the off hours and on weekends during the life of the project.

With reconstruction of the existing STH 178 roadway the project option chosen versus the above mentioned scenario, local access and staging of construction activities will both play major roles in the plan development. Since local access will need to be provided, I am assuming a grading operation will need to be completed one half at a time with excavation, EBS, back-fill, borrow, sand lift and base course progressing down the roadway as access permits. The relocation areas are typically completed separately with the old road in these relocated areas being obliterated at the end. For the sand lift to perform in the pavement structure, the sand cannot be placed on a rutted un-rolled subgrade. This typically requires the contractor to exercise care in the placing of the lift material. Some type of drain will be required at the low points in the sand lift profile. A breaker run was not chosen due the availability of local materials.

With this type of work, it is beneficial to work during the dry part of the summer. Even with these precautions, there is a reasonable chance that stage construction grading might not be completed in one year. Soft spots in the base could be common place under the reconstruct option. If the base course and the two lower layers were placed in year one, the surface layer could be placed the following year. This approach would allow some repair of the broken up areas prior to the final surface being placed.

SUMMARY OF COSTS-----*LCCA*

A twenty year service life was used.

The first alternative is : 175mm(7") PCC over 150mm(6") base over sand lift:
$219008 per KM for initial construction cost
$ 11463 per KM for Equivalent Uniform Annual Cost

The second alternative is : 125mm(5") AC over 275mm(11") base course over 275mm(11") sand lift:
$155257 per KM for initial construction cost
$ 9759 per KM for Equivalent Uniform Annual Cost

The third alternative is : 140mm(5 ½")AC over 300(12") base course *
$157763 per KM for initial construction cost
$ 9921 per KM for Equivalent Uniform Annual Cost

* Not recommended due to sand lift requirement. For information purposes only

RECOMMENDATIONS

LOCATION	PAVEMENT STRUCTURE	THICKNESS
STH 178-mainline & bypass lanes	Asphalt/ Base Course/ Sand Lift	125mm/275mm/275mm (5") /(11") /(11")
Side Roads >500 ADT	Asphalt/ Base Course	100mm/300mm (4") /(12")
Side Roads <500 ADT	Asphalt/Base Course	75mm /225mm (3") /(9")

Type MV Asphaltic Concrete Pavement mix with PG grade 58-28 should be used for this project. It is anticipated that by the time this plan is let to bid, a different PG graded oil could be the standard. The designer should coordinate the special provisions to reflect the correct AC type.

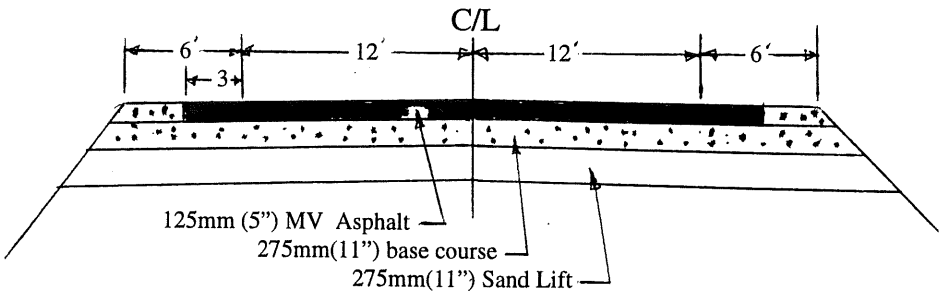
The 125mm(5") asphalt pavement should be constructed with two lower layers totaling 85mm(3 ½") and a upper layer of 40mm(1 ½"). The 100mm(4") asphalt pavement should be constructed with a 50mm(2") lower layer and a 50mm(2") upper layer. The 75mm(3") asphalt pavement should be constructed with two layers.

The sand lift should be specified to meet Grade #1 requirements as specified in the Standard Specifications Section 209.2.2 for granular backfill.

The designer should use asphaltic surface items for incidental asphalt work such as driveways, safety islands, etc. as allowed under the 1997 Supplemental Specs.

Randy W. Luedtke, P.E.

PROPOSED TYPICAL



RIGID PAVEMENT DESIGN WORKSHEET

Version 3.3

07/13/98

8600–02–01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

TRAFFIC:

CONSTRUCTION YEAR	2002
CONSTRUCTION YEAR ADT	2,000
DESIGN YEAR	2022
DESIGN YEAR ADT	2,400
DIRECTIONAL FACTOR (DF)	0.50
LANE DISTRIBUTION FACTOR (LDF)	1.00
TRAFFIC ANALYSIS PERIOD	20.0
DESIGN LANE TRAFFIC (DLT)	1,100

LOADING:

TRUCK TYPE	% OF ADT	DLT	# TRUCKS	ESAL LOAD FACTOR	ESAL'S
2D	3.6	1,100	40	0.3	12
3–SU	1.3	1,100	14	1.2	17
2S–1,2S–2	0.8	1,100	9	0.6	5
3S–2	2.3	1,100	25	1.6	40
DBL BTM	0.0	1,100	0	2.1	0
DESIGN LANE DAILY ESAL's	8.0				74
DESIGN LANE TOTAL LIFE ESAL's					540,200

SOILS:

MODULUS OF SUBGRADE REACTION (K)	30

THICKNESSES:

CALCULATED PAVEMENT THICKNESS	155
PAVEMENT THICKNESS TO BE USED	175

FLEXIBLE PAVEMENT DESIGN WORKSHEET

Version 3.3

07/13/98

8600–02–01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

TRAFFIC:

CONSTRUCTION YEAR	2002
CONSTRUCTION YEAR ADT	2,000
DESIGN YEAR	2022
DESIGN YEAR ADT	2,400
DIRECTIONAL FACTOR (DF)	0.50
LANE DISTRIBUTION FACTOR (LDF)	1.00
TRAFFIC ANALYSIS PERIOD	20.0
DESIGN LANE TRAFFIC (DLT)	1,100

LOADING:

TRUCK TYPE	% OF ADT	DLT	# TRUCKS	ESAL LOAD FACTOR	ESAL's
2D	3.6	1,100	40	0.3	12
3–SU	1.3	1,100	14	0.8	11
2S–1,2S–2	0.8	1,100	9	0.5	4
3S–2	2.3	1,100	25	0.9	23
DBL BTM	0.0	1,100	0	2.0	0
DESIGN LANE DAILY ESAL's	8.0				50
DESIGN LANE TOTAL LIFE ESAL's					365,000

SOILS:

DESIGN GROUP INDEX	14
SOIL SUPPORT VALUE	4.0
FROST INDEX	F–3

DESIGN – SN VALUE & MIX TYPE:

SERVICEABILITY INDEX	3.0
REQUIRED SN VALUE	3.49

ASPHALT MIX TYPE: MV

ALTERNATE DESIGN:

LAYER	Asphalt/base/sand THICKNESS	COEFF.	SN	Asphalt/base THICKNESS	COEFF.	SN
SURFACE:	**SURFACE**			**SURFACE**		
ASPHALTIC CONCRETE	125	0.0173	2.16	140	0.0173	2.42
EXISTING ASPHALT		0.0100	0.00			0.00
BASE COURSE:	**BASE**			**BASE**		
CRUSHED AGG. BASE COURSE	275	0.0039	1.07	300	0.0039	1.17
OPEN GRADED BASE COURSE #1			0.00			0.00
OPEN GRADED BASE COURSE #2			0.00			0.00
EXISTING BASE		0.0039	0.00		0.0039	0.00
EXISTING AC			0.00			0.00
PULVERIZED AC			0.00			0.00
EXISTING PCC			0.00			0.00
RUBBLIZED PCC			0.00			0.00
CRACK (BREAK) & SEAT PCC			0.00			0.00
SUBBASE COURSE:	**SUBBASE**			**SUBBASE**		
CRUSHED AGG. BASE COURSE			0.00			0.00
BREAKER RUN			0.00			0.00
GRANULAR SUBBASE	275	0.0012	0.33			0.00
EXISTING SAND LIFT		0.0025	0.00		0.0025	0.00
TOTAL SN VALUE			3.57			3.59

FLEXIBLE PAVEMENT DESIGN

ALTERNATE DESIGN:

LAYER	Existing Structure THICKNESS	COEFF.	SN	THICKNESS	COEFF.	SN
SURFACE:		**SURFACE**			**SURFACE**	
ASPHALTIC CONCRETE	125	0.0173	2.16		0.0173	0.00
EXISTING ASPHALT			0.00			0.00
BASE COURSE:		**BASE**			**BASE**	
CRUSHED AGG. BASE COURSE			0.00		0.0039	0.00
OPEN GRADED BASE COURSE #1			0.00			0.00
OPEN GRADED BASE COURSE #2			0.00			0.00
EXISTING BASE	125	0.0039	0.49			0.00
EXISTING AC			0.00			0.00
PULVERIZED AC			0.00			0.00
EXISTING PCC			0.00			0.00
RUBBLIZED PCC			0.00			0.00
CRACK (BREAK) & SEAT PCC			0.00			0.00
SUBBASE COURSE:		**SUBBASE**			**SUBBASE**	
CRUSHED AGG. BASE COURSE			0.00			0.00
BREAKER RUN			0.00			0.00
GRANULAR SUBBASE			0.00		0.0012	0.00
EXISTING SAND LIFT		0.0025	0.00			0.00
TOTAL SN VALUE			2.65			0.00

SN is Less Than SNreq'd

PAVEMENT SURFACE FRICTION DESIGN

Version 3.3

07/13/98

8600-02-01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178

Chippewa

TRAFFIC:

CONSTRUCTION YEAR ADT	2,000		
DESIGN YEAR ADT	2,400	EXP. GROWTH RATE	0.92%
DIRECTIONAL FACTOR (DF)	0.50		
LANE DISTRIBUTION FACTOR (LDF)	1.00		
% HEAVY VEHICLES (HV)	8.0		
AC PAVEMENT AGE OR SERVICE LIFE (YR)	15.0	AC "AGE" ADT	2,293
AC LAVP AT SPECIFIED AGE (IN MILLIONS)	5.876		
PC PAVEMENT AGE OR SERVICE LIFE (YR)	25.0	PC "AGE" ADT	2,512
PC LAVP AT SPECIFIED AGE (IN MILLIONS)	10.293		

AGGREGATE PROPERTIES:

	AC MIX AGGREGATES	PCC MIX AGGREGATES
% DOLOMITE	0	0
% LA WEAR	20	20

AC AGGREGATE SOURCE:
PCC AGGREGATE SOURCE:

DESIGN:

ASPHALTIC SURFACE FORMULA

$$FN40 = 41.4 - 1.45 \ln(LAVP) + 0.245(LAWEAR) - 0.00075(DOLOMITE)^2$$

FN40 AT SPECIFIED PAVEMENT AGE	43.7
% PROBABILITY THAT CALCULATED VALUE IS < 35	7.9

AGE (YR) WHEN FN40=35	AGE>50

CONCRETE SURFACE FORMULA

$$\ln(FN40) = 3.99 - 0.0419\ln(LAVP) - 0.00129(DOLOMITE) + 0.00474(HV)$$

FN40 AT SPECIFIED PAVEMENT AGE	50.9
% PROBABILITY THAT CALCULATED VALUE IS < 35	<0.05%

AGE (YR) WHEN FN40=35	AGE>50

BID ITEM COSTS

Version 3.3

07/13/98

8600–02–01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

BID ITEM	BID ITEM #	UNITS	UNIT COST
ASPHALTIC MATERIAL FOR TACK COAT	40204	L	$1.00
ASPHALTIC MATERIAL FOR PLANT MIXES	40501	Mg	$155.00
ASPHALTIC CONCRETE PAVEMENT, TYPE HV	40712	Mg	$22.00
ASPHALTIC CONCRETE PAVEMENT, TYPE MV	40713	Mg	$16.50
ASPHALTIC CONCRETE PAVEMENT, TYPE LV	40714	Mg	$16.50
RECYCLED ASPHALTIC SURFACE, TYPE HV	90381	Mg	
RECYCLED ASPHALTIC SURFACE, TYPE MV	90382	Mg	
RECYCLED ASPHALTIC SURFACE, TYPE LV	90383	Mg	
CONCRETE PAVEMENT, 150 mm	41506	sm	$13.50
CONCRETE PAVEMENT, 175 mm	41507	sm	$18.00
CONCRETE PAVEMENT, 200 mm	41508	sm	$18.00
CONCRETE PAVEMENT, 225 mm	41509	sm	$20.25
CONCRETE PAVEMENT, 250 mm	41510	sm	
CONCRETE PAVEMENT, 275 mm	41511	sm	
CONCRETE PAVEMENT, 300 mm	41512	sm	
CONCRETE WIDENING	41530	sm	
CONTINUOUS CONCRETE PAV'T REINFORCEMENT	41551	sm	
PAVEMENT TIES	41571	EACH	$5.00
DOWEL BARS	41572	EACH	$5.00
CRUSHED AGGREGATE BASE COURSE	30404	Mg	$7.75
OPEN GRADED BASE COURSE #1	30418	Mg	$9.00
OPEN GRADED BASE COURSE #2	30420	Mg	$9.00
ASPHALTIC BASE COURSE	30601	Mg	
ASPHALTIC BASE COURSE WIDENING	30606	Mg	
CONCRETE BASE COURSE	30706–9	sm	
CONCRETE BASE COURSE WIDENING	30751	sm	
BREAKER RUN	30426	Mg	$7.00
GRANULAR SUBBASE COURSE	21201	cm	$3.30
MILL AND RELAY ASPHALTIC CONCRETE PAVEMENT		sm	$0.86
SALVAGED ASPHALTIC PAVEMENT	41010	Mg	
SALVAGED ASPHALTIC PAVEMENT, MILLING	41020	Mg	$7.72
ASPHALTIC SURFACE, PATCHING	41102	Mg	
PULVERIZING ASPHALTIC CONCRETE PAVEMENT		sm	$0.70
BASE PATCHING, ASPHALTIC	30810	sm	
BASE PATCHING, CONCRETE	30820	sm	$40.95
CRACKING AND SEATING CONCRETE PAVEMENT	41040	sm	
BREAKING AND SEATING CONCRETE PAVEMENT		sm	
CONCRETE PAVEMENT REPAIR	41574	cm	$183.00
CONTINUOUS DIAMOND GRINDING	41576	sm	$2.69
RUBBLIZING CONCRETE PAVEMENT		sm	
CONCRETE CURB & GUTTER, 750 mm, TYPE A	60123	m	
CONCRETE CURB & GUTTER, 750 mm, TYPE D	60133	m	
GEOTEXTILE FABRIC, TYPE DF	64503	sm	$1.20
PIPE UNDERDRAIN, 150 mm	61201	m	$4.43
PIPE UNDERDRAIN, UNPERFORATED, 150 mm	61211	m	$22.15
R.C. APRON ENDWALLS FOR UNDERDRAIN	61254	EACH	$125.00
REMOVING PAVEMENT	20401	sm	
GEO–GRID	'90xxx	sm	$1.75

ALTERNATE DESCRIPTION WORKSHEET

Version 3.3

07/13/98

8600-02-01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

PARAMETER	UNITS	ALT 1 VALUE	ALT 2 VALUE	ALT 3 VALUE	ALT 4 VALUE	ALT 5 VALUE	ALT 6 VALUE
RURAL OR URBAN PROJECT	R/U	r	r	r			
ROADWAY WIDTH	m	10.80	10.80	10.80			
PAVEMENT STRUCTURE WIDTH	m	7.20	7.20	7.20			
TOTAL PAVED SHOULDER WIDTH	m	1.80	1.80	1.80			
CONCRETE RDWY PAVEMENT THICKNESS	mm	175					
CONCRETE SHOULDER THICKNESS	mm	175					
AC RDWY PAVEMENT MIX TYPE	HV/MV/LV		MV	MV			
TOTAL AC RDWY PAVEMENT THICKNESS	mm		125	140	125		
VIRGIN AC RDWY PAVEMENT THICKNESS	mm		125	140			
% OF ASPHALT CEMENT USED	%		6.0	6.0			
RECYCLED AC RDWY PAVEMENT THICKNESS	mm						
% OF ASPHALT CEMENT USED	%						
% RAP	%						
AC SHOULDER PAVEMENT MIX TYPE	HV/MV/LV		MV	mv			
TOTAL AC SHOULDER PAVEMENT THICKNESS	mm		125	140			
VIRGIN AC SHOULDER THICKNESS	mm		125	140			
RECYCLED AC SHOULDER THICKNESS	mm						
% OF ASPHALT CEMENT USED	%		6.0	6.0			
ASPHALTIC CONCRETE PAVEMENT WT.	kg/sm/mm	2.35	2.35	2.35	2.35	2.35	2.35
TACK COAT COVERAGE	L/sm	0.113	0.113	0.113	0.113	0.113	0.113
WHICH LAYER IS THE DRAINAGE LAYER?	0-4	0	0	0	0	0	0
CRUSHED AGG. BASE COURSE THICKNESS	mm	150.00	275.00	300.00	0		
UNIT WT OF CABC	Mg/cm	2.4	2.4	2.4			
OPEN GRADED BASE COURSE #1 THICKNESS	mm		0	0	0		
UNIT WT OF OGBC #1	Mg/cm						
OPEN GRADED BASE COURSE #2 THICKNESS	mm			0	0		
UNIT WT OF OGBC #2	Mg/cm						
BREAKER RUN THICKNESS	mm		0	0	0		
UNIT WT OF BREAKER RUN	Mg/cm						
ASPHALTIC STABILIZED B.C. THICKNESS	mm						
% OF ASPHALTIC CEMENT USED	%						
UNIT WT OF AC STABILIZED BASE COURSE	Mg/cm						
P.C. STABILIZED BASE COURSE THICKNESS	mm						
UNIT WT OF PCC STABILIZED BASE COURSE	Mg/cm						
GRANULAR SUBBASE COURSE THICKNESS	mm	275	275	0	0		
OTHER #1 (STRUCTURE WIDTH)	mm						
	Mg/cm						
OTHER #2 (ROADWAY WIDTH)	mm						
	Mg/cm						
EXISTING PAVEMENT WIDTH	m		6.70	6.70			
EXISTING PAVEMENT THICKNESS	mm						
% OF PROJECT LENGTH FOR CURB & GUTTER	%						
TYPE OF CURB & GUTTER	A/D						
% OF PROJECT LENGTH FOR GEOTEXTILE FABRIC	%						
% OF PROJECT LENGTH FOR UNDERDRAINS	%						
% OF PROJECT LENGTH FOR TACK COATING	%		66	66			
TOTAL m2 OF CRCP STEEL REINFORCEMENT	sm						
%OF PROJECT LENGTH FOR MILL & RELAY AC PAV'T	%						
%OF PROJECT PAV'T AREA FOR AC SURF PATCHING	%						
%OF PROJECT LENGTH FOR PULVERIZING AC PAV'T	%						
MILLING DEPTH	mm						
%OF PROJECT LENGTH FOR SALV AC PAV'T MILLING	%						
%OF PROJECT LENGTH FOR SALV AC PAV'T	%						
%OF PROJECT LENGTH FOR DIAMOND GRINDING	%						
%OF PROJECT LENGTH FOR PCC PAV'T REPAIR	%						
#OF PAV'T TIES PER METER OF LONGIT. LENGTH	EACH						
#DOWELS PER PATCH JOINT	EACH						
AVG. LENGTH OF PCC PATCH	m						
%OF PROJECT LENGTH FOR CRACK & SEAT	%						
%OF PROJECT LENGTH FOR BREAK & SEAT	%						
%OF PROJECT LENGTH FOR RUBBLIZING	%						
TOTAL AREA FOR ASPHALTIC BASE PATCHING	sm						
TOTAL AREA FOR CONCRETE BASE PATCHING	sm						
TOTAL AREA FOR CONCRETE WIDENING	sm						
TOTAL AREA FOR AC BASE COURSE WIDENING	sm						
TOTAL AREA FOR PCC BASE COURSE WIDENING	sm						
%OF PROJECT LENGTH FOR PAVEMENT REMOVAL	%						

BASE LAYER: (FOR QUANTITY CALCULATIONS)

X – NONE
A – CABC
B – OGBC #1
C – OGBC #2
D – BREAKER RUN
E – AC STABILIZED
F – PC STABILIZED
G – GRANULAR
H – OTHER #1
I – OTHER #2

	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 6
LAYER 1	a	a	a	x	x	x
LAYER 2	g	g	x	x	x	x
LAYER 3	x	x	x	x	x	x
LAYER 4	x	x	x	x	x	x

ALTERNATE QUANTITIES AND COSTS

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PARAMETER	UNITS	ALTERNATIVE #1 PCC		ALTERNATE #2 Asphalt/base/sand		ALTERNATE #3 Asphalt/base	
		QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
CONCRETE PAVEMENT (RDWY)	sm	7,200.0	$129,600.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT (SHOULDERS)	sm	1,800.0	$32,400.00	0.0	$0.00	0.0	$0.00
VIRGIN AC PAVEMENT (RDWY)	Mg	0.0	$0.00	2,115.0	$34,897.50	2,368.8	$39,085.20
VIRGIN AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	528.8	$8,724.38	592.2	$9,771.30
RECYCLED AC PAVEMENT (RDWY)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
RECYCLED AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALT CEMENT	Mg	0.0	$0.00	158.6	$24,586.88	177.7	$27,537.30
CRUSHED AGG. BASE COURSE	Mg	5,658.0	$43,849.50	9,204.0	$71,331.00	10,239.4	$79,355.04
OPEN GRADED BASE COURSE #1	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
OPEN GRADED BASE COURSE #2	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAKER RUN	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
GRANULAR SUBBASE COURSE	cm	3,987.5	$13,158.75	4,152.5	$13,703.25	0.0	$0.00
CURB & GUTTER	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
TYPE DF GEOTEXTILE FABRIC	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
150 mm PIPE UNDERDRAINS	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
150mm PIPE UNDERDRAINS,UNPERFORATED	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
APRON ENDWALLS FOR UNDERDRAINS	EACH	0	$0.00	0	$0.00	0	$0.00
TACK COATING	L	0.0	$0.00	2,013.7	$2,013.66	2,013.7	$2,013.66
MILL & RELAY AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT,MILLING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC SURFACE PATCHING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
PULVERIZING AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONTINUOUS DIAMOND GRINDING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT REPAIR	cm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CRCP REINFORCEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
PAVEMENT TIES	EACH	0	$0.00	0	$0.00	0	$0.00
DOWEL BARS	EACH	0	$0.00	0	$0.00	0	$0.00
CRACK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
RUBBLIZING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE WIDENING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
REMOVING PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
Cost Adjustment - see comps							
OTHER BASE #1	Mg	0.0		0.0		0.0	
OTHER BASE #2	Mg	0.0		0.0		0.0	
ALTERNATIVE TOTAL			$219,008.25		$155,256.66		$157,762.50

ALTERNATE QUANTITIES AND COSTS

PARAMETER	UNITS	ALTERNATE #4 Existing Structure		ALTERNATE #5 0		ALTERNATE #6 0	
		QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
CONCRETE PAVEMENT (RDWY)	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT (SHOULDERS)	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
VIRGIN AC PAVEMENT (RDWY)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
VIRGIN AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
RECYCLED AC PAVEMENT (RDWY)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
RECYCLED AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALT CEMENT	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CRUSHED AGG. BASE COURSE	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
OPEN GRADED BASE COURSE #1	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
OPEN GRADED BASE COURSE #2	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAKER RUN	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE	cm	0.0	$0.00	0.0	$0.00	0.0	$0.00
GRANULAR SUBBASE COURSE	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
CURB & GUTTER	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
TYPE DF GEOTEXTILE FABRIC	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
150 mm PIPE UNDERDRAINS	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
150mm PIPE UNDERDRAINS,UNPERFORATED	EACH	0	$0.00	0	$0.00	0	$0.00
APRON ENDWALLS FOR UNDERDRAINS	L	0.0	$0.00	0.0	$0.00	0.0	$0.00
TACK COATING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
MILL & RELAY AC PAVEMENT	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT,MILLING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC SURFACE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
PULVERIZING AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONTINUOUS DIAMOND GRINDING	cm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT REPAIR	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CRCP REINFORCEMENT	EACH	0	$0.00	0	$0.00	0	$0.00
PAVEMENT TIES	EACH	0	$0.00	0	$0.00	0	$0.00
DOWEL BARS	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CRACK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
RUBBLIZING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE WIDENING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
REMOVING PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
Cost Adjustment - see comps							
OTHER BASE #1	Mg	0.0		0.0		0.0	
OTHER BASE #2	Mg	0.0		0.0		0.0	
			$0.00		$0.00		$0.00

ALTERNATIVE TOTAL

ALTERNATE MAINTENANCE

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MAINTENANCE COSTS: (CURRENT YEAR)

ALTERNATE TITLE	INCREMENT 1		INCREMENT 2		INCREMENT 3		INCREMENT 4		INCREMENT 5	
	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR
PCC	12	13	17	18	24	25	27	28	33	34
YEARLY COST	$2,400.00		$4,970.00		$4,970.00		$4,970.00		$1,250.00	
Asphalt/base/sand	2	3	9	10	16	17	22	23	28	29
YEARLY COST	$1,250.00		$1,550.00		$1,250.00		$1,550.00		$1,250.00	
Asphalt/base	2	3	9	10	16	17	22	23	28	29
YEARLY COST	$1,250.00		$1,550.00		$1,250.00		$1,550.00		$1,250.00	
Existing Structure										
YEARLY COST										
0										
YEARLY COST										
0										
YEARLY COST										

MAINTENANCE COSTS: (CURRENT YEAR)

ALTERNATE TITLE	INCREMENT 6		INCREMENT 7		INCREMENT 8		INCREMENT 9		INCREMENT 10	
	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR
PCC	37	38	43	44	47	48				
YEARLY COST	$1,550.00		$1,250.00		$1,550.00					
Asphalt/base/sand	34	35	40	41	47	48				
YEARLY COST	$1,550.00		$1,250.00		$1,550.00					
Asphalt/base	34	35	40	41	47	48				
YEARLY COST	$1,550.00		$1,250.00		$1,550.00					
Existing Structure										
YEARLY COST										
0										
YEARLY COST										
0										
YEARLY COST										

ALTERNATE REHABILITATION

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ASPHALT PAVEMENT REHABILITATION SCHEMES:

SCHEME	Mill / Overlay Limits 1: RDWY ONLY 2:RDWY & Shoulders	MILLING DEPTH (mm)	% OF PROJECT for SURF. PATCHING	OVERLAY THICKNESS (mm)	MIX TYPE (HV,MV,LV)	% AC in OVERLAY MIX	OTHER COSTS	OTHER COST DESCRIPTION
AC1	2	0	0.0	75	mv	6.0		
AC2	2	25	0.0	90	mv	6.0		
AC3	2	50	0.0	100	mv	6.0		Similar costs to mill&relay and new asphalt
AC4								
AC5								
AC6								
AC7								
AC8								
AC9	RECONSTRUCT: USING ORIGINAL AC LAYER THICKNESSES							

CONCRETE PAVEMENT REHABILITATION SCHEMES:

Repair – Grind SCHEMES	% PCC REPAIR	AVG PATCH LENGTH in m	# DOWELS PER JOINT	% OF PROJECT for PCC Base Patching		OTHER COSTS	OTHER COST DESCRIPTION
PC1	0.0	1.8	32	0.0	& Continuous Grind		
PC2	0.0	1.8	32	1.0	& Continuous Grind		
PC3					& Continuous Grind		

Repair – Overlay SCHEMES	% PCC REPAIR	AVG PATCH LENGTH in m	# DOWELS PER JOINT	% OF PROJECT for PCC Base Patching	% OF PROJECT for AC Base Patching	OVERLAY THICKNESS (mm)	MIX TYPE (HV,MV,LV)	% AC in OVERLAY MIX	OVERLAY LIMITS 1: RDWY ONLY 2: RDWY & Shoulders	OTHER COSTS	OTHER COST DESCRIPTION
PC4	0.0	1.8	12	5.0	0.0	0		6.0	2		
PC5	0.0	1.8	12	5.0	0.0	75	mv	6.0	2		
PC6											

Mill – Repair – Overlay SCHEMES	Mill / Overlay Limits 1: RDWY ONLY 2:RDWY & Shoulders	MILLING DEPTH (mm)	% PCC REPAIR	AVG PATCH LENGTH in m	# DOWELS PER JOINT	% OF PROJECT for PCC Base Patching	% OF PROJECT for AC Base Patching	OVERLAY THICKNESS (mm)	MIX TYPE (HV,MV,LV)	% AC in OVERLAY MIX	OTHER COSTS
PC7	2	75	0.0	1.8	12	2.0	0.0	75	mv	6.0	
PC8											
PC9											

PC7 OTHER COST DESCRIPTION	
PC8 OTHER COST DESCRIPTION	
PC9 OTHER COST DESCRIPTION	

SCHEME		OTHER COSTS	OTHER COST DESCRIPTION
PC10	CONTINUOUS DIAMOND GRIND ONLY		
PC11	RECONSTRUCT: USING ORIGINAL PCC LAYER THICKNESSES		

ALTERNATE REHABILITATION SCENARIOS:

REHABILITATION COSTS (COSTS ARE CURRENT YEAR)	ALT. #1: PCC SPACING	TYPE	CURRENT YR COST	ALT. #2: Asphalt/base/sand SPACING	TYPE	CURRENT YR COST	ALT. #3: Asphalt/base SPACING	TYPE	CURRENT YR COST	ALT. #4: Existing Structure SPACING	TYPE	CURRENT YR COST
FIRST REHABILITATION	20	PC4	$14,742.00	14	AC2	$57,402.45	14	AC2	$57,402.45			$0.00
SECOND REHABILITATION	10	PC5	$60,212.25	12	AC3	$66,438.90	12	AC3	$66,438.90			$0.00
THIRD REHABILITATION	10	PC7	$61,101.90	12	AC9	$70,222.41	12	AC9	$78,407.46			$0.00
FOURTH REHABILITATION			$0.00			$0.00			$0.00			$0.00
FIFTH REHABILITATION			$0.00			$0.00			$0.00			$0.00
EXPECTED LIFE OF LAST REHABILITATION	10			14			14					
TOTAL LIFE	50			52			52			0		

LIFE CYCLE COST ANALYSIS

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CURRENT YEAR	1998	DISCOUNT RATE (%)	5.0
CONSTRUCTION YEAR	2002	PROJECT LENGTH (Km)	1.00
DESIGN YEAR	2022	ANALYSIS BASIS (P/M)	M
ANALYSIS PERIOD	50.0		

	ALT. 1	ALT. 2	ALT. 3	ALT. 4	ALT.5	ALT. 6
TERMINAL SALVAGE VALUE						

PRESENT WORTH COSTS: (CURRENT YEAR)

	ALT. 1 PCC	ALT. 2 Asphalt/base/sand	ALT. 3 Asphalt/base	ALT. 4 Existing Structure	ALT.5 0	ALT. 6 0
INITIAL CONSTRUCTION COSTS	$180,178.63	$127,730.04	$129,791.60	$0.00	$0.00	$0.00
REHABILITATION COSTS	$23,173.16	$48,271.80	$49,326.35	$0.00	$0.00	$0.00
MAINTENANCE COSTS	$5,916.56	$3,441.68	$3,441.68	$0.00	$0.00	$0.00
TERMINAL SALVAGE VALE	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
REHABILITATION SALVAGE VALUE	$0.00	($1,292.49)	($1,443.14)	$0.00	$0.00	$0.00
TOTAL FACILITY COSTS	$209,268.35	$178,151.02	$181,116.49	$0.00	$0.00	$0.00

EQUIVALENT UNIFORM ANNUAL COSTS: (OVER ANALYSIS PERIOD)

	ALT. 1 PCC	ALT. 2 Asphalt/base/sand	ALT. 3 Asphalt/base	ALT. 4 Existing Structure	ALT.5 0	ALT. 6 0
INITIAL CONSTRUCTION COSTS	$9,869.60	$6,996.63	$7,109.56	$0.00	$0.00	$0.00
REHABILITATION COSTS	$1,269.35	$2,644.17	$2,701.94	$0.00	$0.00	$0.00
MAINTENANCE COSTS	$324.09	$188.52	$188.52	$0.00	$0.00	$0.00
TERMINAL SALVAGE VALE	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
REHABILITATION SALVAGE VALUE	$0.00	($70.80)	($79.05)	$0.00	$0.00	$0.00
TOTAL FACILITY COSTS	$11,463.04	$9,758.53	$9,920.97	$0.00	$0.00	$0.00

7/14/98 WISCONSIN DEPARTMENT OF TRANSPORTATION IPFMBC
06:26:33 PAVEMENT INDEX FILE SYSTEM
BROWSE OF CURRENT PDI & PSI VALUES

District 6 County Name CHIPPEWA County Number 9 Highway 178N

Enter S in Opt Field to View Section Data

Opt	From RP + Distance	From Feature	To RP + Distance	*Current* Surface Yr	Ty	*PDI* Survey Yr	No.	*IRI* Survey Yr	mm/m
	011G + 0.000	CTH. Y	012K + 0.000	85	1	96	28	97	1.83
	012K + 0.000	182ND. ST.	014G + 0.000	85	1	96	49	97	1.40
	014G + 0.000	CTH Y INT	015 + 0.000	81	1	96	57	97	2.38
	015 + 0.000	FINLEY LAKE RD	015 + 0.980	81	1	96	76	97	3.08
	015 + 0.980	160TH AVE.	017 + 0.000	87	1	96	34	97	2.75
	017 + 0.000	210TH ST.	018 + 0.000	79	1	96	70	97	3.50
	018 + 0.000	215TH ST.	018 + 0.680	88	1	96	31	97	2.46
	018 + 0.680	SECTION 9 & 10	020 + 0.000	84	1	96	50	97	2.86
	020 + 0.000	180TH AVE	022 + 0.000	88	1	96	41	97	2.97
	022 + 0.000	190TH AVE.	023 + 0.000	83	2	96	75	97	3.58

Surf Type 1=ACPM/FB,2=BRM, 3=ACPM/RB, 4=JRCP, 5=JPCP w/o d, 6=CRCP, 8=JPCP /d

SELECT DATA TO VIEW, OR PRESS ENTER FOR MORE
ENTER TO CONTINUE PF3 OR PF15 TO BROWSE MENU PA2 TO CANCE
PF2 OR PF14 TO PRIMARY MENU PF12 OR PF24 TO LOGOFF CICS

7/14/98 WISCONSIN DEPARTMENT OF TRANSPORTATION IPFMBC
06:26:41 PAVEMENT INDEX FILE SYSTEM
BROWSE OF CURRENT PDI & PSI VALUES

District 6 County Name CHIPPEWA County Number 9 Highway 178N

Enter S in Opt Field to View Section Data

Opt	From RP	+	Distance	From Feature	To RP	+	Distance	*Current* Surface Yr	Ty	*PDI* Survey Yr	No.	*IRI* Survey Yr	mm/m
	022	+	0.000	190TH AVE.	023	+	0.000	83	2	96	75	97	3.58
	023	+	0.000	CTH R INT	024	+	0.000	87	1	96	38	97	2.60
	024	+	0.000	CTH ZZ INT	024	+	1.250	81	1	96	24	97	2.45
	024	+	1.250	SECTION 25 & 24	027	+	0.000	84	1	96	66	97	2.57
	027	+	0.000	STH 64E	499E	+	0.000						
		+				+							
		+				+							
		+				+							
		+				+							
		+				+							

Surf Type 1=ACPM/FB,2=BRM, 3=ACPM/RB, 4=JRCP, 5=JPCP w/o d, 6=CRCP, 8=JPCP /d

NO MORE SECTIONS FOR COUNTY & HIGHWAY
ENTER TO CONTINUE PF3 OR PF15 TO BROWSE MENU PA2 TO CANCE
PF2 OR PF14 TO PRIMARY MENU PF12 OR PF24 TO LOGOFF CICS

CORRESPONDENCE/MEMORANDUM State of Wisconsin

Date: July 13, 1998

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: Traffic Forecast projection revisions
Project 8600-02-01

This project has been in and out of the six year program for the last 5-10 years. There has been no recent specific traffic forecast done for this segment. For structural design purposes, I chose to use a construction year ADT of 2000 and a 20 year ADT of 2400. The truck percentage was rounded to 8%. The following two forecasts done in 1992 and 1995 give volumes for the roadway but are outdated.

TRAFFIC FORECAST

PROJECT ID: 8600-02-71
COUNTY: Chippewa
ROUTE: STH 178
LOCATION: Int. w/ CTH Y to Int. w/ STH 64

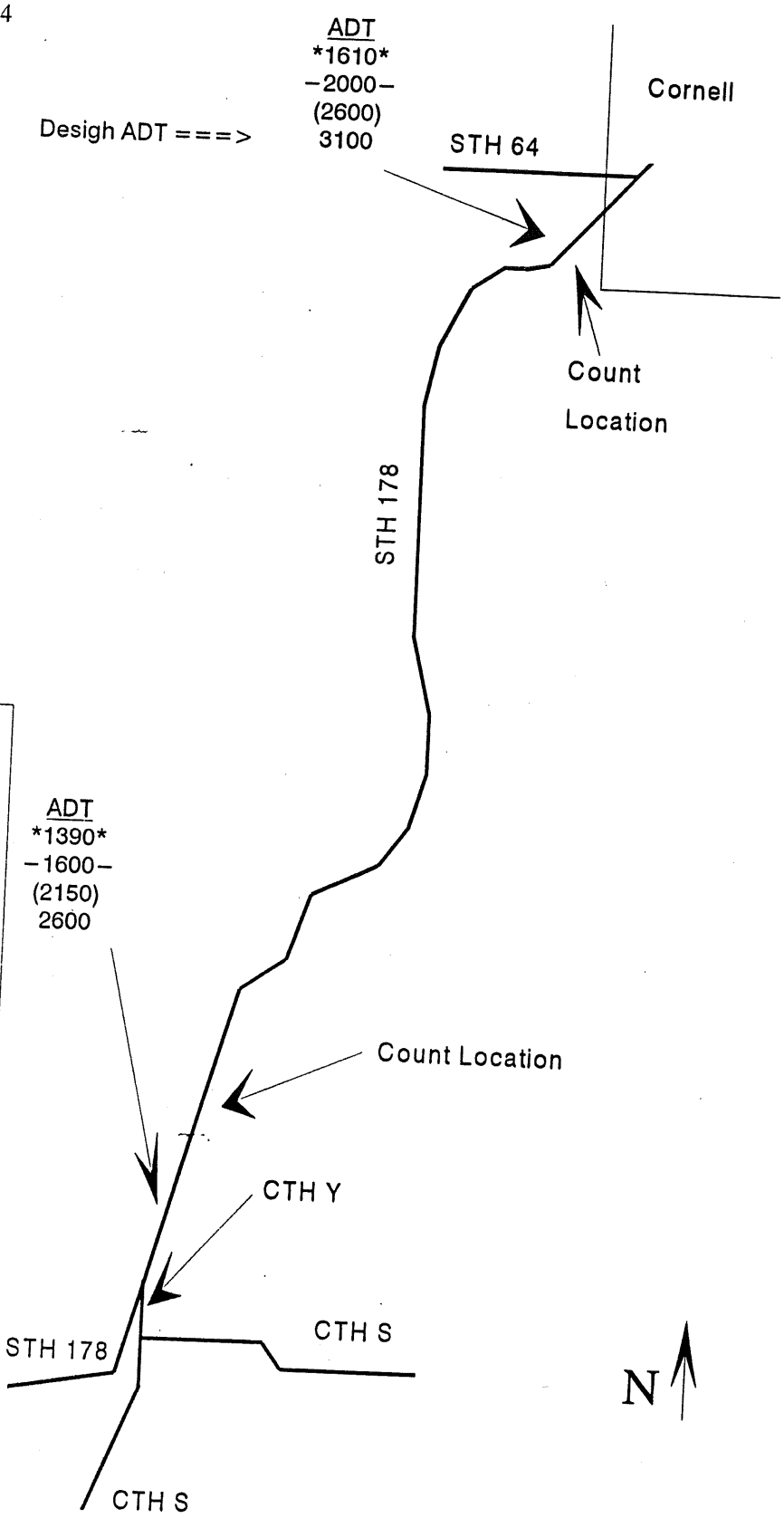
KEY	
000	1991 Traffic Count
-000-	1994 Forecast
(000)	2004 Forecast
000	2014 Forecast

DESIGN VALUES	
K100	11.6
K50	12.4
K30	13.1
P(PHV)	16.9
T(DHV)	6.2
T(PHV)	3.5
D	60/40
K8(ADT)	--
T(A8HV)	--

TRUCK CLASS	
TRUCK TYPE	% ADT
2D	3.6
3AX	1.4
2S1+2S2	0.7
3-S2	2.0
DBL-BTM	0.0
TOTAL	7.7

NOTES ON THE ANALYSIS:

1. The functional classification of STH 178 over the project section is COLLECTOR; the seasonal adjustment factor group for the section is group 4.
2. In developing this forecast, it was assumed that no new major traffic generators will be developed in the vicinity of the project section over the course of the forecast period.
4. In developing the forecast for the southern site, the the historical traffic count for 1975 was excluded from the analysis because it departed substantially from the trend in the other historical counts.
5. Truck percentages of ADT were obtained from a table of vehicle type percentages by functional class and urban/rural area because a vehicle type counter is not located on STH 178.
6. Design parameters are calculated using the design year ADT for the northern most forecast location (3100).

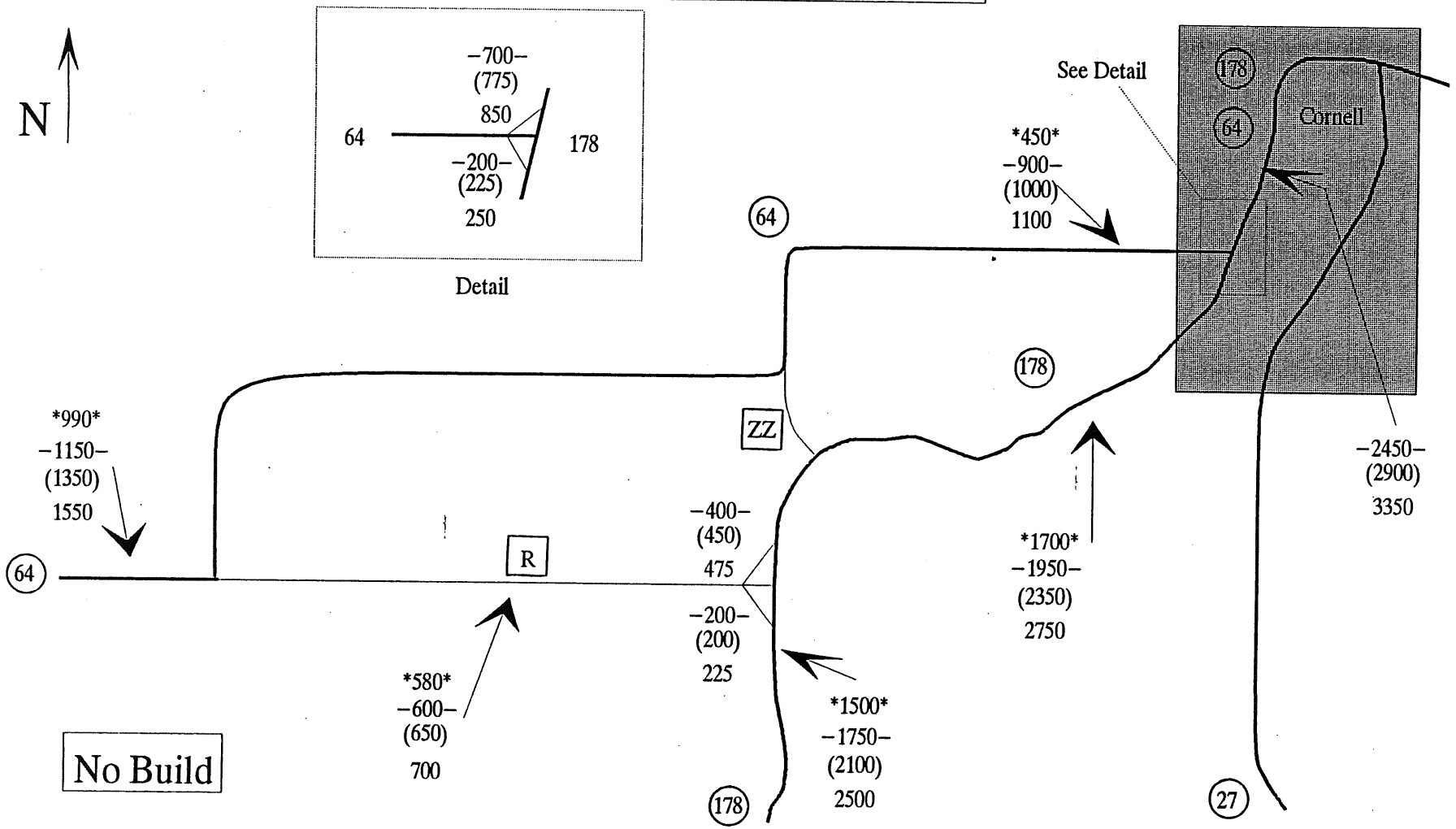


Developed by Keith Wendt, Traffic Forecasting and Analysis Section 14-Sep-92

PROJECT ID: 8191–01–01
COUNTY: Chippewa
ROUTE: STH 64
LOCATION: STH 64: CTH R to STH27
DISTRICT: 6

KEY	
000	1993 ADT
–000–	1999 ADT
(000)	2009 ADT
000	2019 ADT

Developed by Scott Erdman, Traffic Analysis & Forecasting Sect.; Phone: (608) 266–1010;
E–Mail ID: ERDMAS
Completed: 26–Jul–95



DESIGN VALUES	
K100	11.5
K50	12.3
K30	12.9
P(PHV)	16.7
T(DHV)	6.2
T(PHV)	3.5
D	60/40
K8(ADT)	NA
T(A8HV)	NA

TRUCK CLASS	
TRUCK TYPE	% ADT
2D	3.6
3AX	1.4
2S1+2S2	0.7
3–S2	2.0
Dbl–Btm	0.0
TOTAL	7.7

Notes on the Forecast:

1. Historic and projected traffic volumes represent Axle – Adjusted AADT. Pre – 1990 counts are factored using indicated Axle – Adjustment Factors (A–AF).
2. This forecast assumes that no signficant new traffic generators will be developed in the project area during the forecast period.
3. STH 64 has an axle – adjustment factor of .93 and is in Factor Group 4, indicating moderate seasonal traffic fluctuation.

REFERENCES

1. "Wisconsin Highway Traffic", available coverage counts, 1975 – 1993.
2. "Official Poulation Estimates, Demographic Services Center, DOA.

CONCEPT DEFINITION REPORT

Date: 07/17/96 To: Michael A. Cass (P.E.) From: District 6

I. Design ID: 8600-02-01 Related ID(s): 8600-02-71(Const)
Highway No. or Local Road Name: STH 178 8600-02-21 (R/W)
Title: CHIPPEWA FALLS - CORNELL ROAD
County: CHIPPEWA Length: 7.4 Miles 11.9 km
Functional Class: Major Collector Current ADT: 1650 (1993)
LOCATION: CTH Y - CTH R

II. A. Roadway Conditions:
Pavement: Type: AC Width: 22 Year: 1981
PSI: 2.69 (1993) PDI: 30 (1994)
Shoulder: Type: Gravel Width: 2
Accident Rate: 480 Year: 1995
Substandard Alignment: Horizontal: Yes Vertical: Yes

B. Structure: (may be continued on back side)
Type: DECK GIRDER Length: 86.5 ft, 26.4 m
Bridge Number: B-09-0682 Year Constructed: 1942
Clear Roadway Width: 27.6 SR: 80.5 RS: 89.4

JUSTIFICATION: Accident rate is 480 vs State ave of 222 because of narrow shoulders, sharp horiz curvature and short vertical and horiz sight distance. There are many power poles and trees in clear zone.

III. PROPOSED IMPROVEMENT: Grade, Base, Asphaltic Surface to C3 standards with a 24 ft surface on a 36 ft roadway with a 30 ft clear zone.

A. Environmental documentation type: III ER
B. Improvement Type: RECST PMSID: 98060020201
C. Cost: $ 3,850,000 Program Year: 2002 Program: 3334
D. Local Participation: $ No Access Control: No

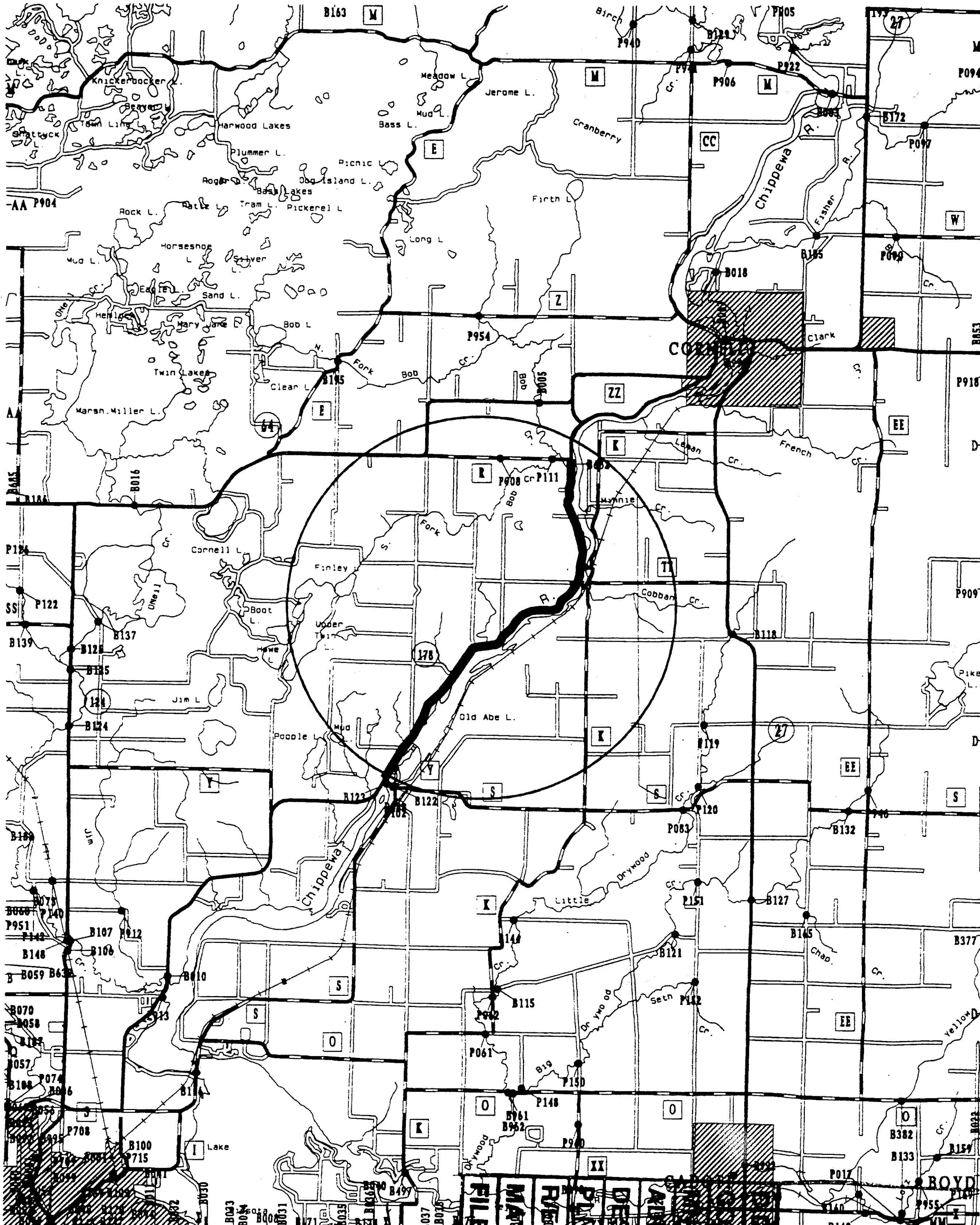
==========

DISTRICT 6 APPROVAL

Cordell Lindell — 7-17-96
Project Supervisor — Date

Mark R Gardner — 17 Jul 96
Planning Supervisor — Date

CC: Gerry Feiler - Rm 951, Len Stanek - Rm 651, Bureau of Environment - Rm 451
Gene Hoelker - FHWA
District 6 Geographic Information System



CHIPPEWA COUNTY
PROJECT ID 8600-02-71

Dist. 6 Rec'd
JUL 17 1996

7/14/98 WISCONSIN DEPARTMENT OF TRANSPORTATION IPFMBC
06:26:08 PAVEMENT INDEX FILE SYSTEM
BROWSE OF CURRENT PDI & PSI VALUES

District 6 County Name CHIPPEWA County Number 9 Highway 178N

Enter S in Opt Field to View Section Data

Opt	From RP + Distance	From Feature	To RP + Distance	*Current* Surface Yr	Ty	*PDI* Survey Yr	No.	*IRI* Survey Yr	mm/m
	001 + 0.000	BAY ST INT	002 + 0.000	55	1	96	91	97	5.16
	002 + 0.000	FRONT ST INT	003 + 0.000	81	1	96	34	97	3.17
	003 + 0.000	CTH I (KENNEDY ST)	004 + 0.000	85	1	96	54	97	2.00
	004 + 0.000	CTH S INT	005K + 0.000	85	1	96	33	97	1.80
	005K + 0.000	93RD AVE	006G + 0.000	85	1	96	33	97	1.75
	006G + 0.000	101ST AVE	007D + 0.000	85	1	96	33	97	1.96
	007D + 0.000	110TH AVE	008G + 0.000	85	1	96	85	97	2.15
	008G + 0.000	120TH AVE	009K + 0.000	85	1	96	54	97	2.00
	009K + 0.000	170TH ST	011G + 0.000	85	1	96	21	97	1.85
	011G + 0.000	CTH. Y	012K + 0.000	85	1	96	28	97	1.83

Surf Type 1=ACPM/FB,2=BRM, 3=ACPM/RB, 4=JRCP, 5=JPCP w/o d, 6=CRCP, 8=JPCP /d

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ENTER TO CONTINUE PF3 OR PF15 TO BROWSE MENU PA2 TO CANCE
PF2 OR PF14 TO PRIMARY MENU PF12 OR PF24 TO LOGOFF CICS

CORRESPONDENCE/MEMORANDUM State of Wisconsin

Date: June 24, 1998

To: File

From: Randy W. Luedtke, P.E.
District#6 Pavement Design Engineer

Subject: Pavement Documentation
Project I.D. 8600-03-31 or 01
Chippewa - Cornell Road
CTH I - CTH Y
STH 178
Chippewa County

This project was initially scoped or programmed as a Rut Fill type project. Since that time, after in-house discussion and coordination with county officials, it was agreed that a thin overlay is a better choice. Due to the existing rutting a lower leveling course will need to be placed to fill in the ruts before a surface layer is placed. The contractor ***should not*** be allowed to place the total plan asphalt thickness in one lift.

At this point in time this pavement treatment is considered as a roadway maintenance type project. No formal documentation of the pavement selection or LCCA is required beyond what is stated in the Design Study Report.

The following typical should be done:

A. A lower level should be initially placed to fill in the ruts(pavement distortion) in the wheel paths. It should be stated as a variable depth layer ranging from ¾" to 1". This note may cause a red flag but it can be achieved with a grade #3 surface mix.
B. The upper layer or surface pass should be constructed of 1 ¼ - 1 ½ ". If the programming designation or RDMNT threshold of 2 ½ " is waived the surface lift should be increased to 2 inches.
C. Designate the mix as MV grade #3(surface mix) for both layers.

It is assumed that this treatment will provide an additional 8-10 years of service versus 3-5 years for the typical rut fill.

There is a possibility that some areas may be excavated to alleviate frost heave areas. A typical depth of 5" asphalt over 12" of base course should be used for those areas. The surface thickness should match the adjacent segments.

Reviewed: Richard J. Shermo, P.E.
PD Area Supervisor

Approved: Michael S. Ostrowski, P.E.
PD Manager

LAST → RWL 8/10
MSO 8/4
Jim Koening 8/3

CORRESPONDENCE/MEMORANDUM State of Wisconsin

Date: June 24, 1998

To: File

From: Randy W. Luedtke, P.E.
District#6 Pavement Design Engineer

Subject: Pavement Documentation
Project I.D. 8600-03-31 or 01
Chippewa - Cornell Road
CTH I - CTH Y
STH 178
Chippewa County

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Reviewed: _____
Richard J. Shermo, P.E.
PD Area Supervisor

Approved: _____
Michael S. Ostrowski, P.E.
PD Manager

LAST → RWL 8/10
MSO 8/4
Jim Koening 8/3

Date: January 7, 1997

To: File

From: Randy W. Luedtke, P.E.
District Pavement Design Engineer

Subject: VERY PRELIMINARY PAVEMENT OPTIONS
Project 8600-02-31
Chippewa Falls-Cornell
CTH Y - CTH R
STH 178
Chippewa County

This project involves the portion of STH 178 from Jim Falls northerly to CTH R. This project area was designated previously for a roadway maintenance type project in 1998, but now the roadway is re-evaluated in comparision to 100km/hr(60 m.p.h.) standards. To facilitate preliminary design work, a preliminary depth to subgrade was requested. This document was prepared for preliminary project costing analysis and preliminary template design.

TRAFFIC PROJECTIONS

THE FOLLOWING TRAFFIC PROJECTIONS USED MAY NOT BE VALID FOR FINAL PAVEMENT DESIGN.---PRELIMINARY ONLY!!

STH 178
The construction year (0 year) ADT is 2000 and the 20 year ADT is 2400.

Truck percentages are as follows:

TRUCK TYPE		%
2D		3.6
3AX		1.3
2SI,2S2		0.8
3-S2		2.3
DBL. BTM		0.0
	TOTAL	8.0

PROPOSED IMPROVEMENT

This project is being evaluated to be brought up to 60 mph standards.

SOIL ENGINEERING FACTORS

The soils on this project consist of Chetek soils. The DGI is 14 with a soil support value of 4.0.

ALTERNATES EVALUATED *VERY PRELIMINARY ONLY!!!*

A twenty year service life was used.

For the relocation situation, a rigid and a flexible structure has been provided.

Relocation:

The first alternate is: 175mm(7") PCC over 150mm(6") of DGBC over 225mm(9") sand lift
DEPTH TO SUBGRADE: 750mm(30")

The second alternate is: 125mm(5") MV Asphalt over 275mm(11")DGBC over 275mm(11") sand lift
DEPTH TO SUBGRADE: 675mm(27")

Shoulder widening areas: 115mm(4.5") MV Asphalt over 150mm(6") of milled & relayed of the existing surface*

*short areas of gravel lifts may be an option to correct slight vertical profile deficiencies.

No Life Cycle Cost Analysis has been done at this time. Other pavement options may be evaluated at a later date.

Randy W. Luedtke, P.E.

RIGID PAVEMENT DESIGN WORKSHEET

Version 3.3

01/06/97

8600-02-31
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

OLD

TRAFFIC:

CONSTRUCTION YEAR	2002
CONSTRUCTION YEAR ADT	2,000
DESIGN YEAR	2022
DESIGN YEAR ADT	2,400
DIRECTIONAL FACTOR (DF)	0.50
LANE DISTRIBUTION FACTOR (LDF)	1.00
TRAFFIC ANALYSIS PERIOD	20.0
DESIGN LANE TRAFFIC (DLT)	1,100

LOADING:

TRUCK TYPE	% OF ADT	DLT	# TRUCKS	ESAL LOAD FACTOR	ESAL'S
2D	3.6	1,100	40	0.3	12
3-SU	1.3	1,100	14	1.2	17
2S-1,2S-2	0.8	1,100	9	0.6	5
3S-2	2.3	1,100	25	1.6	40
DBL BTM	0.0	1,100	0	2.1	0
DESIGN LANE DAILY ESAL's	8.0				74
DESIGN LANE TOTAL LIFE ESAL's					540,200

SOILS:

MODULUS OF SUBGRADE REACTION (K)	30

THICKNESSES:

CALCULATED PAVEMENT THICKNESS	155
PAVEMENT THICKNESS TO BE USED	175

FLEXIBLE PAVEMENT DESIGN WORKSHEET

Version 3.3

01/06/97

8600–02–31
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

TRAFFIC:

CONSTRUCTION YEAR	2002
CONSTRUCTION YEAR ADT	2,000
DESIGN YEAR	2022
DESIGN YEAR ADT	2,400
DIRECTIONAL FACTOR (DF)	0.50
LANE DISTRIBUTION FACTOR (LDF)	1.00
TRAFFIC ANALYSIS PERIOD	20.0
DESIGN LANE TRAFFIC (DLT)	1,100

LOADING:

TRUCK TYPE	% OF ADT	DLT	# TRUCKS	ESAL LOAD FACTOR	ESAL's
2D	3.6	1,100	40	0.3	12
3–SU	1.3	1,100	14	0.8	11
2S–1,2S–2	0.8	1,100	9	0.5	4
3S–2	2.3	1,100	25	0.9	23
DBL BTM	0.0	1,100	0	2.0	0
DESIGN LANE DAILY ESAL's	8.0				50
DESIGN LANE TOTAL LIFE ESAL's					365,000

SOILS:

DESIGN GROUP INDEX	14
SOIL SUPPORT VALUE	4.0
FROST INDEX	F–3

DESIGN – SN VALUE & MIX TYPE:

SERVICEABILITY INDEX	3.0
REQUIRED SN VALUE	3.49

ASPHALT MIX TYPE: MV

ALTERNATE DESIGN:

LAYER	Asphalt/surface mill THICKNESS	COEFF.	SN	Asphalt/Pulverize&Relay THICKNESS	COEFF.	SN
SURFACE:	SURFACE			SURFACE		
ASPHALTIC CONCRETE	100	0.0173	1.73	115	0.0173	1.99
EXISTING ASPHALT	100	0.0100	1.00			0.00
BASE COURSE:	BASE			BASE		
CRUSHED AGG. BASE COURSE			0.00			0.00
OPEN GRADED BASE COURSE #1			0.00			0.00
OPEN GRADED BASE COURSE #2			0.00			0.00
EXISTING BASE		0.0039	0.00		0.0039	0.00
EXISTING AC			0.00			0.00
PULVERIZED AC			0.00	150	0.0100	1.50
EXISTING PCC			0.00			0.00
RUBBLIZED PCC			0.00			0.00
CRACK (BREAK) & SEAT PCC			0.00			0.00
SUBBASE COURSE:	SUBBASE			SUBBASE		
CRUSHED AGG. BASE COURSE			0.00			0.00
BREAKER RUN			0.00			0.00
GRANULAR SUBBASE			0.00			0.00
EXISTING SAND LIFT		0.0025	0.00		0.0025	0.00
TOTAL SN VALUE			2.73			3.49
	SN is Less Than SNreq'd			SN is Less Than SNreq'd		

FLEXIBLE PAVEMENT DESIGN

ALTERNATE DESIGN:

LAYER	Existing Structure THICKNESS	COEFF.	SN	Asphalt/base/sand THICKNESS	COEFF.	SN
SURFACE:		SURFACE			SURFACE	
ASPHALTIC CONCRETE	125	0.0173	2.16	125	0.0173	2.16
EXISTING ASPHALT			0.00			0.00
BASE COURSE:		BASE			BASE	
CRUSHED AGG. BASE COURSE			0.00	275	0.0039	1.07
OPEN GRADED BASE COURSE #1			0.00			0.00
OPEN GRADED BASE COURSE #2			0.00			0.00
EXISTING BASE	125	0.0039	0.49			0.00
EXISTING AC			0.00			0.00
PULVERIZED AC			0.00			0.00
EXISTING PCC			0.00			0.00
RUBBLIZED PCC			0.00			0.00
CRACK (BREAK) & SEAT PCC			0.00			0.00
SUBBASE COURSE:		SUBBASE			SUBBASE	
CRUSHED AGG. BASE COURSE			0.00			0.00
BREAKER RUN			0.00			0.00
GRANULAR SUBBASE			0.00	275	0.0012	0.33
EXISTING SAND LIFT		0.0025	0.00			0.00
TOTAL SN VALUE			2.65			3.57

SN is Less Than SNreq'd

PAVEMENT SURFACE FRICTION DESIGN

Version 3.3

01/06/97

8600-02-31
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178

Chippewa

TRAFFIC:

CONSTRUCTION YEAR ADT	2,000		
DESIGN YEAR ADT	2,400	EXP. GROWTH RATE	0.92%
DIRECTIONAL FACTOR (DF)	0.50		
LANE DISTRIBUTION FACTOR (LDF)	1.00		
% HEAVY VEHICLES (HV)	8.0		
AC PAVEMENT AGE OR SERVICE LIFE (YR)	15.0	AC "AGE" ADT	2,293
AC LAVP AT SPECIFIED AGE (IN MILLIONS)	5.876		
PC PAVEMENT AGE OR SERVICE LIFE (YR)	25.0	PC "AGE" ADT	2,512
PC LAVP AT SPECIFIED AGE (IN MILLIONS)	10.293		

AGGREGATE PROPERTIES:

	AC MIX AGGREGATES	PCC MIX AGGREGATES
% DOLOMITE	0	0
% LA WEAR	20	20

AC AGGREGATE SOURCE:
PCC AGGREGATE SOURCE:

DESIGN:

ASPHALTIC SURFACE FORMULA

$$FN40 = 41.4 - 1.45 \ln(LAVP) + 0.245(LAWEAR) - 0.00075(DOLOMITE)^2$$

FN40 AT SPECIFIED PAVEMENT AGE	43.7
% PROBABILITY THAT CALCULATED VALUE IS < 35	7.9

AGE (YR) WHEN FN40=35	AGE>50

CONCRETE SURFACE FORMULA

$$\ln(FN40) = 3.99 - 0.0419\ln(LAVP) - 0.00129(DOLOMITE) + 0.00474(HV)$$

FN40 AT SPECIFIED PAVEMENT AGE	50.9
% PROBABILITY THAT CALCULATED VALUE IS < 35	<0.05%

AGE (YR) WHEN FN40=35	AGE>50

BID ITEM COSTS

Version 3.3

01/06/97

8600-02-31
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

BID ITEM	BID ITEM #	UNITS	UNIT COST
ASPHALTIC MATERIAL FOR TACK COAT	40204	L	$0.29
ASPHALTIC MATERIAL FOR PLANT MIXES	40501	Mg	$154.32
ASPHALTIC CONCRETE PAVEMENT, TYPE HV	40712	Mg	$22.05
ASPHALTIC CONCRETE PAVEMENT, TYPE MV	40713	Mg	$18.75
ASPHALTIC CONCRETE PAVEMENT, TYPE LV	40714	Mg	$16.75
RECYCLED ASPHALTIC SURFACE, TYPE HV	90381	Mg	
RECYCLED ASPHALTIC SURFACE, TYPE MV	90382	Mg	
RECYCLED ASPHALTIC SURFACE, TYPE LV	90383	Mg	
CONCRETE PAVEMENT, 150 mm	41506	sm	
CONCRETE PAVEMENT, 175 mm	41507	sm	$18.00
CONCRETE PAVEMENT, 200 mm	41508	sm	$18.00
CONCRETE PAVEMENT, 225 mm	41509	sm	$20.25
CONCRETE PAVEMENT, 250 mm	41510	sm	
CONCRETE PAVEMENT, 275 mm	41511	sm	
CONCRETE PAVEMENT, 300 mm	41512	sm	
CONCRETE WIDENING	41530	sm	
CONTINUOUS CONCRETE PAV'T REINFORCEMENT	41551	sm	
PAVEMENT TIES	41571	EACH	$5.00
DOWEL BARS	41572	EACH	$5.00
CRUSHED AGGREGATE BASE COURSE	30404	Mg	$6.75
OPEN GRADED BASE COURSE #1	30418	Mg	$8.25
OPEN GRADED BASE COURSE #2	30420	Mg	$8.30
ASPHALTIC BASE COURSE	30601	Mg	$7.25
ASPHALTIC BASE COURSE WIDENING	30606	Mg	
CONCRETE BASE COURSE	30706-9	sm	
CONCRETE BASE COURSE WIDENING	30751	sm	
BREAKER RUN	30426	Mg	$6.00
GRANULAR SUBBASE COURSE	21201	cm	$3.30
MILL AND RELAY ASPHALTIC CONCRETE PAVEMENT		sm	$0.86
SALVAGED ASPHALTIC PAVEMENT	41010	Mg	
SALVAGED ASPHALTIC PAVEMENT, MILLING	41020	Mg	$7.72
ASPHALTIC SURFACE, PATCHING	41102	Mg	
PULVERIZING ASPHALTIC CONCRETE PAVEMENT		sm	$0.86
BASE PATCHING, ASPHALTIC	30810	sm	
BASE PATCHING, CONCRETE	30820	sm	$40.95
CRACKING AND SEATING CONCRETE PAVEMENT	41040	sm	
BREAKING AND SEATING CONCRETE PAVEMENT		sm	
CONCRETE PAVEMENT REPAIR	41574	cm	$183.00
CONTINUOUS DIAMOND GRINDING	41576	sm	$2.69
RUBBLIZING CONCRETE PAVEMENT		sm	
CONCRETE CURB & GUTTER, 750 mm, TYPE A	60123	m	
CONCRETE CURB & GUTTER, 750 mm, TYPE D	60133	m	
GEOTEXTILE FABRIC, TYPE DF	64503	sm	$1.20
PIPE UNDERDRAIN, 150 mm	61201	m	$4.43
PIPE UNDERDRAIN, UNPERFORATED, 150 mm	61211	m	$22.15
R.C. APRON ENDWALLS FOR UNDERDRAIN	61254	EACH	$125.00
REMOVING PAVEMENT	20401	sm	
GEO-GRID	*90xxx	sm	$1.75

ALTERNATE DESCRIPTION WORKSHEET

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PARAMETER	UNITS	ALT 1 VALUE	ALT 2 VALUE	ALT 3 VALUE	ALT 4 VALUE	ALT 5 VALUE	ALT 6 VALUE
RURAL OR URBAN PROJECT	R/U	r	r	r			
ROADWAY WIDTH	m	10.80	10.80	10.80		10.80	
PAVEMENT STRUCTURE WIDTH	m	7.20	7.20	7.20		7.20	
TOTAL PAVED SHOULDER WIDTH	m	1.80	1.80	1.80		1.80	
CONCRETE RDWY PAVEMENT THICKNESS	mm	175					
CONCRETE SHOULDER THICKNESS	mm	175					
AC RDWY PAVEMENT MIX TYPE	HV/MV/LV		MV	MV		MV	
TOTAL AC RDWY PAVEMENT THICKNESS	mm		100	115	125	125	
VIRGIN AC RDWY PAVEMENT THICKNESS	mm		100	115		125	
% OF ASPHALT CEMENT USED	%		6.0	6.0		6.0	
RECYCLED AC RDWY PAVEMENT THICKNESS	mm						
% OF ASPHALT CEMENT USED	%						
% RAP	%						
AC SHOULDER PAVEMENT MIX TYPE	HV/MV/LV		MV	mv			
TOTAL AC SHOULDER PAVEMENT THICKNESS	mm		125	115			
VIRGIN AC SHOULDER THICKNESS	mm		125	115			
RECYCLED AC SHOULDER THICKNESS	mm						
% OF ASPHALT CEMENT USED	%		6.0	6.0			
ASPHALTIC CONCRETE PAVEMENT WT.	kg/sm/mm	2.35	2.35	2.35	2.35	2.35	2.35
TACK COAT COVERAGE	L/sm	0.113	0.113	0.113	0.113	0.113	0.113
WHICH LAYER IS THE DRAINAGE LAYER?	0-4	0	0	0	0	0	0
CRUSHED AGG. BASE COURSE THICKNESS	mm	0.01	0.01	0.01	0	275	
UNIT WT OF CABC	Mg/cm	2.4	2.4	2.4		2.4	
OPEN GRADED BASE COURSE #1 THICKNESS	mm		0	0	0	0	
UNIT WT OF OGBC #1	Mg/cm						
OPEN GRADED BASE COURSE #2 THICKNESS	mm			0	0	0	
UNIT WT OF OGBC #2	Mg/cm						
BREAKER RUN THICKNESS	mm		0	0	0	0	
UNIT WT OF BREAKER RUN	Mg/cm						
ASPHALTIC STABILIZED B.C. THICKNESS	mm						
% OF ASPHALTIC CEMENT USED	%						
UNIT WT OF AC STABILIZED BASE COURSE	Mg/cm						
P.C. STABILIZED BASE COURSE THICKNESS	mm						
UNIT WT OF PCC STABILIZED BASE COURSE	Mg/cm						
GRANULAR SUBBASE COURSE THICKNESS	mm		0	0	0	275	
OTHER #1 (STRUCTURE WIDTH)	mm						
	Mg/cm						
OTHER #2 (ROADWAY WIDTH)	mm						
	Mg/cm						
EXISTING PAVEMENT WIDTH	m		6.70	6.70			
EXISTING PAVEMENT THICKNESS	mm						
% OF PROJECT LENGTH FOR CURB & GUTTER	%						
TYPE OF CURB & GUTTER	A/D						
% OF PROJECT LENGTH FOR GEOTEXTILE FABRIC	%						
% OF PROJECT LENGTH FOR UNDERDRAINS	%						
% OF PROJECT LENGTH FOR TACK COATING	%		66	50		66	
TOTAL m2 OF CRCP STEEL REINFORCEMENT	sm						
%OF PROJECT LENGTH FOR MILL & RELAY AC PAV'T	%						
%OF PROJECT PAV'T AREA FOR AC SURF PATCHING	%						
%OF PROJECT LENGTH FOR PULVERIZING AC PAV'T	%			100			
MILLING DEPTH	mm		13				
%OF PROJECT LENGTH FOR SALV AC PAV'T MILLING	%		100				
%OF PROJECT LENGTH FOR SALV AC PAV'T	%						
%OF PROJECT LENGTH FOR DIAMOND GRINDING	%						
%OF PROJECT LENGTH FOR PCC PAV'T REPAIR	%						
#OF PAV'T TIES PER METER OF LONGIT. LENGTH	EACH						
#DOWELS PER PATCH JOINT	EACH						
AVG. LENGTH OF PCC PATCH	m						
%OF PROJECT LENGTH FOR CRACK & SEAT	%						
%OF PROJECT LENGTH FOR BREAK & SEAT	%						
%OF PROJECT LENGTH FOR RUBBLIZING	%						
TOTAL AREA FOR ASPHALTIC BASE PATCHING	sm						
TOTAL AREA FOR CONCRETE BASE PATCHING	sm						
TOTAL AREA FOR CONCRETE WIDENING	sm						
TOTAL AREA FOR AC BASE COURSE WIDENING	sm						
TOTAL AREA FOR PCC BASE COURSE WIDENING	sm						
%OF PROJECT LENGTH FOR PAVEMENT REMOVAL	%						

BASE LAYER: (FOR QUANTITY CALCULATIONS)

X – NONE
A – CABC
B – OGBC #1
C – OGBC #2
D – BREAKER RUN
E – AC STABILIZED
F – PC STABILIZED
G – GRANULAR
H – OTHER #1
I – OTHER #2

	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 6
LAYER 1	a	a	a	x	a	x
LAYER 2	X	X	x	x	g	x
LAYER 3	X	X	X	X	X	X
LAYER 4	X	X	X	X	X	X

ALTERNATE QUANTITIES AND COSTS

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PARAMETER	UNITS	ALTERNATIVE #1 PCC		ALTERNATE #2 Asphalt/surface mill		ALTERNATE #3 Asphalt/Pulverize&Relay	
		QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
CONCRETE PAVEMENT (RDWY)	sm	7,200.0	$129,600.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT (SHOULDERS)	sm	1,800.0	$32,400.00	0.0	$0.00	0.0	$0.00
VIRGIN AC PAVEMENT (RDWY)	Mg	0.0	$0.00	1,692.0	$31,725.00	1,945.8	$36,483.75
VIRGIN AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	528.8	$9,914.06	486.5	$9,120.94
RECYCLED AC PAVEMENT (RDWY)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
RECYCLED AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALT CEMENT	Mg	0.0	$0.00	133.2	$20,562.37	145.9	$22,520.69
CRUSHED AGG. BASE COURSE	Mg	1,050.3	$7,089.48	420.3	$2,836.88	624.0	$4,212.28
OPEN GRADED BASE COURSE #1	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
OPEN GRADED BASE COURSE #2	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAKER RUN	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
GRANULAR SUBBASE COURSE	cm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CURB & GUTTER	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
TYPE DF GEOTEXTILE FABRIC	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
150 mm PIPE UNDERDRAINS	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
150mm PIPE UNDERDRAINS,UNPERFORATED	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
APRON ENDWALLS FOR UNDERDRAINS	EACH	0	$0.00	0	$0.00	0	$0.00
TACK COATING	L	0.0	$0.00	1,476.7	$428.24	1,017.0	$294.93
MILL & RELAY AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT,MILLING	Mg	0.0	$0.00	204.7	$1,580.17	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC SURFACE PATCHING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
PULVERIZING AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	6,700.0	$5,762.00
CONTINUOUS DIAMOND GRINDING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT REPAIR	cm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CRCP REINFORCEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
PAVEMENT TIES	EACH	0	$0.00	0	$0.00	0	$0.00
DOWEL BARS	EACH	0	$0.00	0	$0.00	0	$0.00
CRACK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
RUBBLIZING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE WIDENING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
REMOVING PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
Cost Adjustment--see comps			($528.00)		$32.00		($494.00)
OTHER BASE #1	Mg	0.0		0.0		0.0	
OTHER BASE #2	Mg	0.0		0.0		0.0	
ALTERNATIVE TOTAL			$168,561.48		$67,078.72		$77,900.59

ALTERNATE QUANTITIES AND COSTS

PARAMETER	UNITS	ALTERNATE #4 Existing Structure QUANTITY	ALTERNATE #4 COST	ALTERNATE #5 Asphalt/base/sand QUANTITY	ALTERNATE #5 COST	ALTERNATE #6 0 QUANTITY	ALTERNATE #6 COST
CONCRETE PAVEMENT (RDWY)	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT (SHOULDERS)	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
VIRGIN AC PAVEMENT (RDWY)	Mg	0.0	$0.00	2,115.0	$39,656.25	0.0	$0.00
VIRGIN AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
RECYCLED AC PAVEMENT (RDWY)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
RECYCLED AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALT CEMENT	Mg	0.0	$0.00	126.9	$19,583.21	0.0	$0.00
CRUSHED AGG. BASE COURSE	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
OPEN GRADED BASE COURSE #1	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
OPEN GRADED BASE COURSE #2	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAKER RUN	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
GRANULAR SUBBASE COURSE	cm	0.0	$0.00	4,152.5	$13,703.25	0.0	$0.00
CURB & GUTTER	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
TYPE DF GEOTEXTILE FABRIC	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
150 mm PIPE UNDERDRAINS	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
150mm PIPE UNDERDRAINS,UNPERFORATED	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
APRON ENDWALLS FOR UNDERDRAINS	EACH	0	$0.00	0	$0.00	0	$0.00
TACK COATING	L	0.0	$0.00	1,610.9	$467.17	0.0	$0.00
MILL & RELAY AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT,MILLING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC SURFACE PATCHING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
PULVERIZING AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONTINUOUS DIAMOND GRINDING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT REPAIR	cm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CRCP REINFORCEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
PAVEMENT TIES	EACH	0	$0.00	0	$0.00	0	$0.00
DOWEL BARS	EACH	0	$0.00	0	$0.00	0	$0.00
CRACK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
RUBBLIZING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE WIDENING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
REMOVING PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
Cost Adjustment - see comps							
OTHER BASE #1	Mg	0.0		0.0		0.0	
OTHER BASE #2	Mg	0.0		0.0		0.0	
ALTERNATIVE TOTAL			$0.00		$73,409.88		$0.00

ALTERNATE MAINTENANCE

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MAINTENANCE COSTS: (CURRENT YEAR)

ALTERNATE TITLE	INCREMENT 1 FROM YEAR	INCREMENT 1 TO YEAR	INCREMENT 2 FROM YEAR	INCREMENT 2 TO YEAR	INCREMENT 3 FROM YEAR	INCREMENT 3 TO YEAR	INCREMENT 4 FROM YEAR	INCREMENT 4 TO YEAR	INCREMENT 5 FROM YEAR	INCREMENT 5 TO YEAR
PCC	12	13	19	20	24	25	28	29	34	35
YEARLY COST	$2,400.00		$4,970.00		$4,970.00		$4,970.00		$4,970.00	
Asphalt/surface mill	2	3	9	10	16	17	22	23	28	29
YEARLY COST	$1,250.00		$1,550.00		$1,250.00		$1,550.00		$1,250.00	
Asphalt/Pulverize&Relay	2	3	9	10	16	17	22	23	28	29
YEARLY COST	$1,250.00		$1,550.00		$1,250.00		$1,550.00		$1,250.00	
Existing Structure										
YEARLY COST										
Asphalt/base/sand										
YEARLY COST										
0										
YEARLY COST										

MAINTENANCE COSTS. (CURRENT YEAR)

ALTERNATE TITLE	INCREMENT 6 FROM YEAR	INCREMENT 6 TO YEAR	INCREMENT 7 FROM YEAR	INCREMENT 7 TO YEAR	INCREMENT 8 FROM YEAR	INCREMENT 8 TO YEAR	INCREMENT 9 FROM YEAR	INCREMENT 9 TO YEAR	INCREMENT 10 FROM YEAR	INCREMENT 10 TO YEAR
PCC	38	39	43	44	48	49				
YEARLY COST	$4,970.00		$1,250.00		$1,550.00					
Asphalt/surface mill	34	35	40	41	47	48				
YEARLY COST	$1,550.00		$1,250.00		$1,550.00					
Asphalt/Pulverize&Relay	34	35	40	41	47	48				
YEARLY COST	$1,550.00		$1,250.00		$1,550.00					
Existing Structure										
YEARLY COST										
Asphalt/base/sand										
YEARLY COST										
0										
YEARLY COST										

ALTERNATE REHABILITATION

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ASPHALT PAVEMENT REHABILITATION SCHEMES:

SCHEME	Mill / Overlay Limits 1: RDWY ONLY 2:RDWY & Shoulders	MILLING DEPTH (mm)	% OF PROJECT for SURF. PATCHING	OVERLAY THICKNESS (mm)	MIX TYPE (HV,MV,LV)	% AC in OVERLAY MIX	OTHER COSTS	OTHER COST DESCRIPTION
AC1	2	0	0.0	50	mv	6.0	$570.00	cost adjustment program error - see comp sheets
AC2	2	13	0.0	50	mv	6.0	$949.00	cost adjustment - program error - see comp sheets
AC3	1	50	0.0	50	mv	6.0	$0.00	
AC4								
AC5								
AC6								
AC7								
AC8								
AC9	RECONSTRUCT: USING ORIGINAL AC LAYER THICKNESSES							

CONCRETE PAVEMENT REHABILITATION SCHEMES:

Repair -- Grind SCHEMES	% PCC REPAIR	AVG PATCH LENGTH in m	# DOWELS PER JOINT	% OF PROJECT for PCC Base Patching		OTHER COSTS	OTHER COST DESCRIPTION
PC1	0.0	1.8	32	0.0	& Continuous Grind		
PC2	0.0	1.8	32	1.0	& Continuous Grind	$5,059.00	cost adjustment - see comp sheets
PC3					& Continuous Grind		

Repair -- Overlay SCHEMES	% PCC REPAIR	AVG PATCH LENGTH in m	# DOWELS PER JOINT	% OF PROJECT for PCC Base Patching	% OF PROJECT for AC Base Patching	OVERLAY THICKNESS (mm)	MIX TYPE (HV,MV,LV)	% AC in OVERLAY MIX	OVERLAY LIMITS 1: RDWY ONLY 2: RDWY & Shoulders	OTHER COSTS	OTHER COST DESCRIPTION
PC4	0.0	1.8	32	1.0	0.0	50	mv	6.0	2	$5,604.00	cost adjustment - see comp sheets
PC5	0.0	0.0	0	0.0	0.0	50	mv	6.0	1		
PC6											

Mill -- Repair -- Overlay SCHEMES	Mill / Overlay Limits 1: RDWY ONLY 2:RDWY & Shoulders	MILLING DEPTH (mm)	% PCC REPAIR	AVG PATCH LENGTH in m	# DOWELS PER JOINT	% OF PROJECT for PCC Base Patching	% OF PROJECT for AC Base Patching	OVERLAY THICKNESS (mm)	MIX TYPE (HV,MV,LV)	% AC in OVERLAY MIX	OTHER COSTS
PC7	1	50	0.0	0.0	0	0.0	0.0	50	mv	6.0	
PC8											
PC9											

PC7 OTHER COST DESCRIPTION	
PC8 OTHER COST DESCRIPTION	
PC9 OTHER COST DESCRIPTION	

SCHEME		OTHER COSTS	OTHER COST DESCRIPTION
PC10	CONTINUOUS DIAMOND GRIND ONLY		
PC11	RECONSTRUCT: USING ORIGINAL PCC LAYER THICKNESSES		

ALTERNATE REHABILITATION SCENARIOS:

REHABILITATION COSTS (COSTS ARE CURRENT YEAR)	ALT. #1: PCC			ALT. #2: Asphalt/surface mill			ALT. #3: Asphalt/Pulverize&Relay			ALT. #4: Existing Structure		
	SPACING	TYPE	CURRENT YR COST	SPACING	TYPE	CURRENT YR COST	SPACING	TYPE	CURRENT YR COST	SPACING	TYPE	CURRENT YR COST
FIRST REHABILITATION	20	PC2	$27,375.40	14	AC1	$31,942.66	14	AC1	$31,942.66			$0.00
SECOND REHABILITATION	10	PC4	$39,925.06	12	AC2	$34,065.19	12	AC2	$34,065.19			$0.00
THIRD REHABILITATION	10	PC4	$39,925.06	12	AC2	$34,065.19	12	AC2	$34,065.19			$0.00
FOURTH REHABILITATION			$0.00			$0.00			$0.00			$0.00
FIFTH REHABILITATION			$0.00			$0.00			$0.00			$0.00
EXPECTED LIFE OF LAST REHABILITATION	10			12			12					
TOTAL LIFE	50			50			50			0		

ALTERNATE REHABILITATION

ALTERNATE REHABILITATION SCENARIOS:

REHABILITATION COSTS (COSTS ARE CURRENT YEAR)	ALT. #5: Asphalt/base/sand			ALT. #6: 0		
	SPACING	TYPE	CURRENT YR COST	SPACING	TYPE	CURRENT YR COST
FIRST REHABILITATION			$0.00			$0.00
SECOND REHABILITATION			$0.00			$0.00
THIRD REHABILITATION			$0.00			$0.00
FOURTH REHABILITATION			$0.00			$0.00
FIFTH REHABILITATION			$0.00			$0.00
EXPECTED LIFE OF LAST REHABILITATION						
TOTAL LIFE	0			0		

LIFE CYCLE COST ANALYSIS

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CURRENT YEAR	1994	DISCOUNT RATE (%)	5.0
CONSTRUCTION YEAR	2002	PROJECT LENGTH (Km)	1.00
DESIGN YEAR	2022	ANALYSIS BASIS (P/M)	M
ANALYSIS PERIOD	50.0		

	ALT. 1	ALT. 2	ALT. 3	ALT. 4	ALT.5	ALT. 6
TERMINAL SALVAGE VALUE						

PRESENT WORTH COSTS: (CURRENT YEAR)

	ALT. 1 PCC	ALT. 2 Asphalt/surface mill	ALT. 3 Asphalt/Pulverize&Rel	ALT. 4 Existing Structure	ALT.5 Asphalt/base/sand	ALT. 6 0
INITIAL CONSTRUCTION COSTS	$114,089.04	$45,401.52	$52,726.18	$0.00	$49,686.69	$0.00
REHABILITATION COSTS	$17,074.25	$21,014.86	$21,014.86	$0.00	$0.00	$0.00
MAINTENANCE COSTS	$5,508.70	$2,831.48	$2,831.48	$0.00	$0.00	$0.00
TERMINAL SALVAGE VALE	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
REHABILITATION SALVAGE VALUE	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL FACILITY COSTS	$136,671.99	$69,247.86	$76,572.52	$0.00	$49,686.69	$0.00

EQUIVALENT UNIFORM ANNUAL COSTS: (OVER ANALYSIS PERIOD)

	ALT. 1 PCC	ALT. 2 Asphalt/surface mill	ALT. 3 Asphalt/Pulverize&Rel	ALT. 4 Existing Structure	ALT.5 Asphalt/base/sand	ALT. 6 0
INITIAL CONSTRUCTION COSTS	$6,249.43	$2,486.95	$2,888.17	$0.00	$2,721.67	$0.00
REHABILITATION COSTS	$935.27	$1,151.13	$1,151.13	$0.00	$0.00	$0.00
MAINTENANCE COSTS	$301.75	$155.10	$155.10	$0.00	$0.00	$0.00
TERMINAL SALVAGE VALE	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
REHABILITATION SALVAGE VALUE	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
TOTAL FACILITY COSTS	$7,486.45	$3,793.17	$4,194.39	$0.00	$2,721.67	$0.00

CORRESPONDENCE/MEMORANDUM State of Wisconsin

Date: 1 July 1996

To: File

From: Lary A. Hyland, P.E.
District Soils Engineer

Subject: **SOILS ENGINEERING COST ESTIMATE**
Project 8600-02-01
CTH "Y" to CTH "R"
STH 178
Chippewa County

Because of the somewhat unusual nature of the project (winding along the river, rock, marsh pockets etc.) it is particularly difficult to tie cost down this early. Based on guidance that we've been given by CO and our own experience, however, my best estimate would be $20,000. This is about 10% of the design-engineering costs. We may well need marsh borings and lab. work and rock borings/seismograph work in addition to other, more common, borings and soil analysis. Much depends on the amount of substantial relocation required. This would not include structure borings - bridges, culverts, retaining walls - which I assume that we would not have a handle on at this point.

CORRESPONDENCE/MEMORANDUM State of Wisconsin

Date: June 28, 1996

To: file

From: Randy W. Luedtke, P.E.

Subject: PROJECT - 8600-02-01
Chippewa Falls-Cornell
CTH Y-CTH R
STH 178
Chippewa County

PROJECTED BUDGET COSTS

Total Project Cost: $3,200,000

Total Project Engineering Cost(6%) : $192000

Projected Pavement Item Cost(pavement,base,sub-base,etc.)
Initial construction : $1,950,000

% engineering cost applied to Pavements: $1,950,000 @ 6% = $117,000

District Pavement design Assume that 20% of pavement cost engineering total is charged from the Materials Section $ 117000*20%=$23400

COSTS
Pavements charged to "79" Function Codes
(includes charges to "741", "742", & "748",
constructability reviews, P.S.&E compliance reviews, etc.)

salary charges	$ 8,400
Consultant pavement borings & cores	$15,000
TOTAL	$23,400

LARY,
I LIST THIS AMOUNT, BUT SINCE THIS PROJECT IS RELOCATION WHO KNOWS WHAT WILL BE DONE. THIS TOTAL IS A SAFETY NET.
RANDY

Assume that design "19" function code uses other 80%--$93600

This breakdown of costs leaves $ 93600 for other overlapping design pavement related charges such as typicals, quantities, specials, estimates, etc. separate from the "79" function code.

STH 178

7.3 miles = 11.7 km

1500 vehicles assume SN = 3.5

English

5" ASPHALT	= 2.2
10" BASE	1.0
10" sand	.35
	3.55

COST/km

Metric

MV MIX	2650 TON @ $20 = 53000
MAT'L	159 TON @ $60 = 2540
TACK	= $600
BASE	8400 TON @ 7.00 = 58800
SAND	4000 m³ @ 4.50 = 18,000

155840 km

1,823328

plus Side Roads

= 1.95 million

1,950,000 @ 6% = $117,000 TOTAL

$117,000 @ 20% = $23400

168 HRS FOR ME

Consultant pavement boring & CORES

15,000 + 8400

CORRESPONDENCE/MEMORANDUM State of Wisconsin

Date: June 24, 1998

To: File

From: Randy W. Luedtke, P.E.
District#6 Pavement Design Engineer

Subject: Pavement Documentation
Project I.D. 8600-03-31 or 01
Chippewa - Cornell Road
CTH I - CTH Y
STH 178
Chippewa County

This project was initially scoped or programmed as a Rut Fill type project. Since that time, after in-house discussion and coordination with county officials, it was agreed that a thin overlay is a better choice. Due to the existing rutting a lower leveling course will need to be placed to fill in the ruts before a surface layer is placed. The contractor ***should not*** be allowed to place the total plan asphalt thickness in one lift.

At this point in time this pavement treatment is considered as a roadway maintenance type project. No formal documentation of the pavement selection or LCCA is required beyond what is stated in the Design Study Report.

The following typical should be done:

A. A lower level should be initially placed to fill in the ruts(pavement distortion) in the wheel paths. It should be stated as a variable depth layer ranging from ¾" to 1". This note may cause a red flag but it can be achieved with a grade #3 surface mix.
B. The upper layer or surface pass should be constructed of 1 ¼ - 1 ½ ". If the programming designation or RDMNT threshold of 2 ½ " is waived the surface lift should be increased to 2 inches.
C. Designate the mix as MV grade #3(surface mix) for both layers.

It is assumed that this treatment will provide an additional 8-10 years of service versus 3-5 years for the typical rut fill.

There is a possibility that some areas may be excavated to alleviate frost heave areas. A typical depth of 5" asphalt over 12" of base course should be used for those areas. The surface thickness should match the adjacent segments.

Reviewed: Richard J. Shermo, P.E.
PD Area Supervisor

Approved: Michael S. Ostrowski, P.E.
PD Manager

LAST → RWL 8/10
MSO 8/4
Jim Koening 8/3

Date: 03/30/93
From: Norm Ewert EWERTN - HFRC
To: Lary Hyland HYLANL - HFRC
Richard Gosnell GOSNER - HFRC
George McLeod MCLEOG - HFRC
Bruce Eastenson EASTEB - HFRC
Richard Pauser PAUSER - HFRC
Subject: STH 178 - CTH 'Y' to STH 64
Reference: Your note of 03/26/93 15:16 attached below

I have not problem with this. Lets get the plans to show what Lary recommends. If the PS&E is already submitted, I would assume the short short section of deeper milling can be done in the field without a C.O.

Pauser, I would like you to call Bruce Stelzner and tell him what we will be doing and why.

Dick G, has the PS&E been submitted ?

---------- ATTACHED NOTE ----------

Date: 03/26/93
From: LARY HYLAND HYLANL - HFRC
To: Richard Gosnell GOSNER - HFRC
Norman Ewert EWERTN - HFRC
cc: George McLeod MCLEOG - HFRC
Bruce Eastenson EASTEB - HFRC
Richard Pauser PAUSER - HFRC
Subject: STH 178 - CTH 'Y' to STH 64

Some thoughts on the subject project - mostly based on recent events - to be sure we are all of the same thinking/impression/intention:

1. The overall project concept that prevailed in our pavement design interaction was that we should stay with the Maintenance Resurfacing intention. That, as Bruce put it, "We are preserving a nice, 45 MPH highway - that will continue to require maintenance".

2. We all agree, I think, that total recontruction, with a raised roadway and/or good ditches are the ultimate solution to a good job here, as with any road. However, this is, apparently, not cost effective in this case.

3. Our nominal 1 1/2-inch mill with a 2-inch overlay should go a fair way in true-ing thins up.
The overlay will provide a good riding surface for a time but, it is recognized that it will need continued manintenance in a number of areas.

4. We recently looked at a five areas that Design (Dick Pauser) had quetioned us on and, that Maintenance and the County had also evaluated

based on maintenance history. In the final analysis, we decided that in most of those areas the solution to the problem was not worth the expenditure. I.e. continued maintenance was more cost-effective than the total repair effort. There was one exception: an area of several hundred feet, where we recommended that we full-depth mill (3 1/2 inches) and put 4 inches back, if we can fit it in.

5. I suspect that we will receive some critism, particularly from the County because of the continued maitenance but, I certainly don't disagree that this is the way to go with this section of highway.

Date: 02/10/93
From: Norm Ewert EWERTN - HFRC
To: Richard Pauser PAUSER - HFRC
Bruce Eastenson EASTEB - HFRC
Marlin Beekman BEEKMM - HFRC
Subject: STH 178 Maintenance Resurface
Reference: Your note of 02/06/93 13:43 attached below

I don't think we should get into an expensive pavement structure, unless we could get wider shoulders and safety improvements. I don't think we are ready this time around, to talk about widening shoulders by grading ditches etc. So its my opinion we need to keep the improvement this time, to a 'cheap maint' type. The next time around we may need to do a scenic road improvement type of project.
I think we should put in the minimum beam guard as you suggest.
I have no problem with coming up with a method of taking care of the four areas of severe longitudinal cracking.
It would be nice if we had some sections to see what shoulder width we can accomplish without grading. It was my hope that we could get a 22-foot pavement with 2 or 3 foot paved shoulders.

Lets meet with Bruce, Marty and Lary and discuss the project.
Please set up a meeting for this job and Medford.
I am available tomorrow, Thur am or before the 2:00 programming meeting, Fri at 2:30, or anytime Monday the 15th.

---------- ATTACHED NOTE ----------

Date: 02/06/93
From: Richard Pauser PAUSER - HFRC
To: Norman Ewert EWERTN - HFRC
Michael Lenroot LENROM - HFRC
Subject: STH 178 Maintenance Resurface

Mohamd and I met with Bruce Stelzner and someone from the Sheriff's Dept. According to the Sheriff, Hwy 178 has the least problem with accidents in Chippewa County. We reviewed the accident record with him and the conclusion was that none were the fault of the highway in regard to curvature or sight distance. Low shoulders were probably a factor if any.

We then drove the route and four areas along the outside of curves next to the Chippewa River were suggested as needing beam guard if we can install it. Mohamed will have to take some hand level x-sections to find out what it will take. It would appear that a small amount of fill will be required at two of th e locations and at the other two locations it appears that the shoulder would be wide enough.

This was the first time that I really observed the shoulders. They appear wide enough to have 3 ft. of paving. However, they slope away so much including along the outside of curves it appears that we will need to do considerable work to bring them up so we can pave. If we do that, then we are also affecting the inslopes and subsequently the ditches. There are also four areas with lengthy longitudinal cracks where the roadway is sloughing out. Bruce has overlaid these areas to bring them back up. It would seem that if we are going

to spend $ 700,000 to have a decent pavement for the next 10 to 15 years that we should do something with these areas. Bruce suggested undercutting and and placing geo-grid. The question is, how far do we want to go with this project? Just from field observation it would seem that a deep mill and relay as salvaged asphalt base might be worthy of consideration. The roadway could be reshaped and it would take care of the shoulder work at the same time. There could be as much as a foot of black already in place which would give us a problem with a deep mill.

Any comments on this?

Date: 03/26/93
From: LARY HYLAND HYLANL - HFRC
To: Richard Gosnell GOSNER - HFRC
Norman Ewert EWERTN - HFRC
cc: George McLeod MCLEOG - HFRC
Bruce Eastenson EASTEB - HFRC
Richard Pauser PAUSER - HFRC
Subject: STH 178 - CTH 'Y' to STH 64

Some thoughts on the subject project - mostly based on recent events - to be sure we are all of the same thinking/impression/intention:

1. The overall project concept that prevailed in our pavement design interaction was that we should stay with the Maintenance Resurfacing intention. That, as Bruce put it, "We are preserving a nice, 45 MPH highway - that will continue to require maintenance".

2. We all agree, I think, that total recontruction, with a raised roadway and/or good ditches are the ultimate solution to a good job here, as with any road. However, this is, apparently, not cost effective in this case.

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The overlay will provide a good riding surface for a time but, it is recognized that it will need continued manintenance in a number of areas.

4. We recently looked at a five areas that Design (Dick Pauser) had quetioned us on and, that Maintenance and the County had also evaluated based on maintenance history. In the final analysis, we decided that in most of those areas the solution to the problem was not worth the expenditure. I.e. continued maintenance was more cost-effective than the total repair effort. There was one exception: an area of several hundred feet, where we recommended that we full-depth mill (3 1/2 inches) and put 4 inches back, if we can fit it in.

5. I suspect that we will receive some critism, particularly from the County because of the continued maitenance but, I certainly don't disagree that this is the way to go with this section of highway.

(AD-75)

CORRESPONDENCE/MEMORANDUM

STATE OF WISCONSIN

Date: July 7, 1992

File Ref:

To: File

From: Lary A. Hyland, P.E.
District Soils Engineer
By: Jeffrey L. Glass

Subject: Pavement Design Memo
Project 8600-02-31
Chippewa Falls - Cornell Road
(N. Int. CTH Y - STH 64)
STH 178
Chippewa County

The following is recommended for this 10.49 mile project of STH 178:

Mill a nominal 1/2" along entire project length and overlay with 2" of AC. The compromise shoulder thickness for the 12th foot should be 3 1/2" AC, which will cover 25% of the 18kip wheeloads.

Because of the narrow shoulders on this highway and being close to the Chippewa River it is recommended to pave the shoulders as wide as possible, which will mean 2 ft in some areas and 3 ft or more in others, along with marking the lane widths at 11 feet, leaving more shoulder width.

The recommended milling depth is based on the overall condition of the pavement. There is rutting in most places, no measurement of depth has been taken.

Traffic requires Type C asphalt mix for this project.

Lary A. Hyland, P.E.

11 Feb. 93
Based on meeting with Marty, Bruce, Mike, Pause & me
Now the trend is changed to: Mill 1 1/4 Overlay 2" 3 1/2" Rshoulder widening.

Dick G,

Jay FYI

4/28/92

ON our trip to Cornell Jim Wholen & Norm Ewert agreed to the following on the STH 178 Mt Res. project.

(1) Pave the shoulders (3' if possible, although it appears 2' may be as much as you can get in certain situations). Should be checked in the field.

(2) May want to paint the lanes at 22', if only 2' of the shoulders can be paved. (will give room to the bikers).

Jeff Kern

CONCEPT DEFINITION REPORT

Date: March 27, 1992 To: J. W. Dresser From: District Six (6)

I. Design ID: 8600-02-31 Related ID(s): 8600-02-61 (CONST.)
Highway No. or Local Road Name: S.T.H. 178
Title: Chippewa Falls - Cornell Road (N. Int. CTH Y - STH 64)
County: Chippewa Length: 10.49 miles
Functional Class: Major Collector Current ADT: 1,500 (1990)
LOCATION: See Title Above

D.D.		
CON.		
MNT.		
ADM.		
DES.		
PLN.		
R/E		
MAT'L		
FILE		
MCP	X	

II. A. Roadway Conditions:
Pavement: Type: Asphaltic Width: 22 Ft. Year: 1975
PSI: 2.60 PDI: 46
Shoulder: Type: Gravel Width: 2 Ft.
Accident Rate: 343 Year: 1990
Substandard Alignment: Horizontal: No Vertical: No

B. Structure: No structure work is anticipated at this time.
Type: Deck Girder - Steel
Bridge Number: B-09-0682 Year Constructed: 1942
Clear roadway width: 27.6 Ft. SR: 81.6 RS: 89.4

JUSTIFICATION: Longitudinal cracking and rutting maybe contributed to driving hazard.

III. PROPOSED IMPROVEMENT: Mill to shape and overlay with asphaltic pavement. This roadway is located close to the Chippewa River and environmental constraints would preclude widening the roadway. Also this is a maintain only roadway.

A. Environmental documentation type: Programmatic Type IIIB
B. Improvement Type: RDMTN PMSID: 92-060-020-201
C. Cost: $700,000 Program Year: 1994 Program: 3332
D. Local Participation: No Access Control: No

Project Supervisor: Richard J. Pauser, P.E. Accepted By: JWDresser
Recommend Acceptance: Mark R. Ploederer, P.E. Date: 4-1-92

cc: OEA, CWC, Dist 6, JW

1994,2004,2014 TRAFFIC PROJECTION

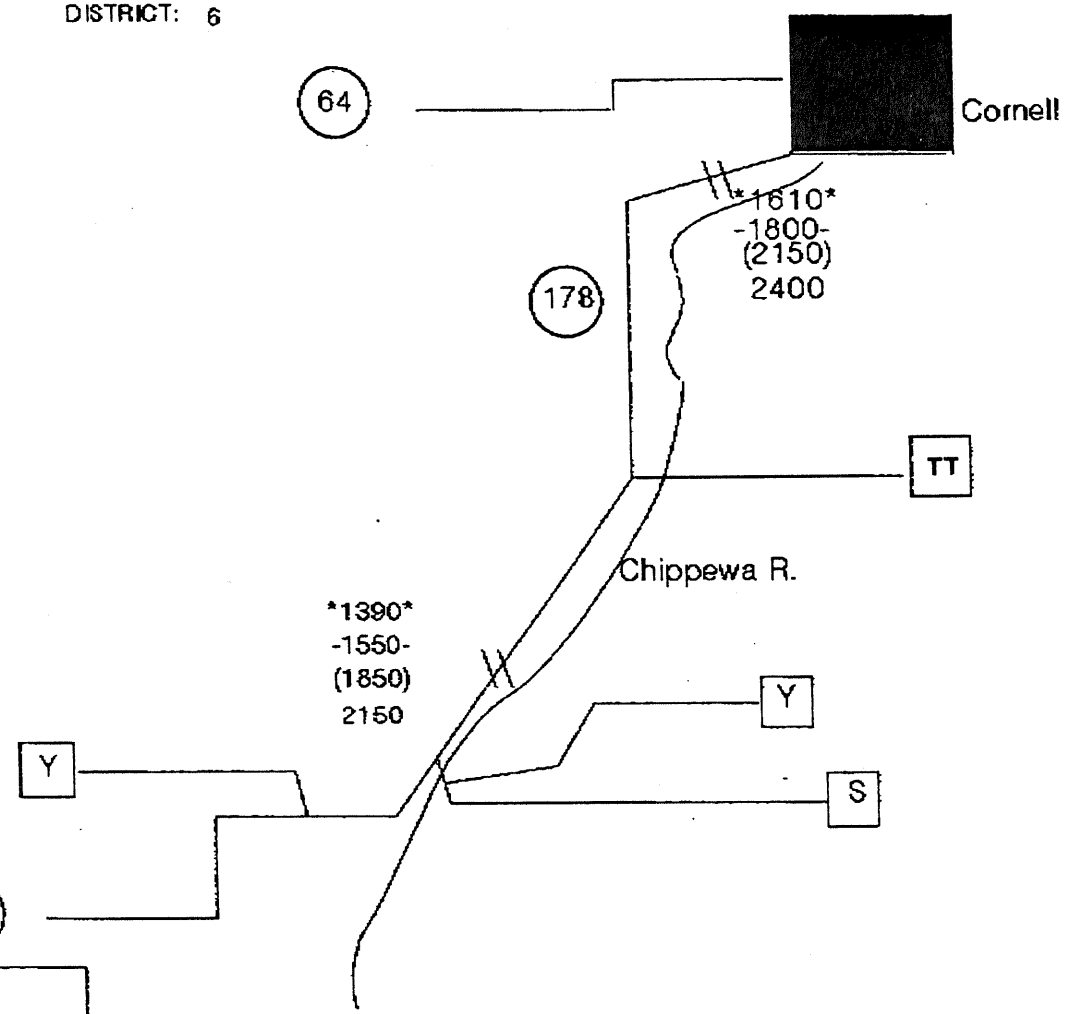
PROJECT ID: 8600-02-31

LOCATION: N. Int. CTH Y - STH 64

ROUTE: STH 178

COUNTY: Chippewa

DISTRICT: 6



000 = latest count (year)

-000- = 1994

(000) = 2004

000 = 2014

TRUCK CLASSIFICATION	
TRUCK TYPE	% ADT
2D	3.6
3AX	1.3
2-S1 + 2-S2	0.8
3-S2+	2.0
DBL BTM	0.0
TOTAL	7.7

DESIGN DATA	
P	17.7%
K_{100}	11.8%
T(DHV)	4.4%
T(PHV)	4.4%
D	60-40

Transportation Forecasts & Analysis Section

KZM July 1, 1992

FLEXIBLE PAVEMENT STRUCTURE DESIGN

Wisconsin Department of Transportation

ED401 8/87

Project ID	Federal Project	Highway	County	Date
8600-02-31		STH 178	Chippewa	7-2-97

Project Name: CTH Y - STH 64 STH178 | District: 6

TRAFFIC

Traffic Analysis Period: 20 Years

Construction Year/ADT	Design Year/ADT	Directional Factor (DF)	Lane Distribution Factor (LDF)
1675	2275	0.5	1

Design Lane Traffic (DLT) = (Constr. Year ADT + Design Year ADT) X DF X LDF

$$\left(\frac{1675 + 2275}{2}\right) \times 0.5 \times 1 = 988$$

LOADING (Use charts "18 Kip Loads for Flexible Pavements" or "18 Kip Loads for County Trunk Highways")

Truck Type	Truck Class. % of ADT		DLT	No. of Trucks		18K Loads
2D	3.6%	X		= (0.3)	=	11
3-SU	1.3%	X		= (0.8)	=	10
2S-1, 2S-2	0.8%	X	988	= (0.5)	=	4
3S-2	2.0%	X		= (0.9)	=	18
DBL BTM	0	X		=	=	

Design Lane Total 18K Loads per Day: 43

DESIGN — $\overline{SN}$ (Use Flexible Pavement Design Charts for Pt = 2.5 or 2.0)

Serviceability Index	Design Group Index	Frost Index	Soil Support Value	$\overline{SN}$
2.5	14	F-3	3.95	3.4

ALTERNATE DESIGNS - SN

	Existing (1)		Straight overlay (2) 1	
Bituminous Concrete	" X 0.44 =		1½ " X 0.44 =	0.66
Existing AC ~~Bituminous Pavement~~	4½ " X 0.35 ~~0.20~~ =	1.6	4½ " X 0.35 ~~0.20~~ =	1.6
Bituminous Base Course (Hot Mix)	" X 0.34 =		" X 0.34 =	
Bituminous Stabilized Base	" X ___ =		" X ___ =	
P.C. Stabilized Base	" X ___ =		" X ___ =	
Gravel or Crushed Stone Base	11 " X 0.10 ~~0.14~~ =	1.1	11 " X 0.10 ~~0.14~~ =	1.1
Granular or Subbase	" X ___ =		" X ___ =	
	" X ___ =		" X ___ =	
	SN =	3.1	SN =	3.36

(Show other alternates on attached sheet)

Recommended Alternate: _____

FLEXIBLE PAVEMENT STRUCTURE DESIGN

Wisconsin Department of Transportation

ED401 8/97

Project ID	Federal Project	Highway	County	Date
8600-02-31		STH 178	Chippewa	7-2-92

Project Name

District

TRAFFIC

Traffic Analysis Period: _____ Years

Construction Year/ADT	Design Year/ADT	Directional Factor (DF)	Lane Distribution Factor (LDF)

Design Lane Traffic (DLT) = $\left(\frac{\text{(Constr. Year ADT + Design Year ADT)}}{2} \times \frac{1}{2}\right) \times \text{DF} \times \text{LDF}$

(_____ + _____ / 2) X _____ X _____ = _____

LOADING (Use charts "18 Kip Loads for Flexible Pavements" or "18 Kip Loads for County Trunk Highways")

Truck Type	Truck Class. % of ADT		DLT		No. of Trucks		18^k Loads
2D	_____	X		=	_____	=	_____
3-SU	_____	X		=	_____	=	_____
2S-1, 2S-2	_____	X	988	=	_____	=	_____
3S-2	_____	X		=	_____	=	_____
DBL BTM	_____	X		=	_____	=	_____

Design Lane Total 18^k Loads per Day 43 X 25% = 11

2.7 SN

DESIGN — $\overline{SN}$ (Use Flexible Pavement Design Charts for Pt = 2.5 or 2.0)

Serviceability Index	Design Group Index	Frost Index	Soil Support Value	$\overline{SN}$
2.5	14	F-3	3.95	3.4

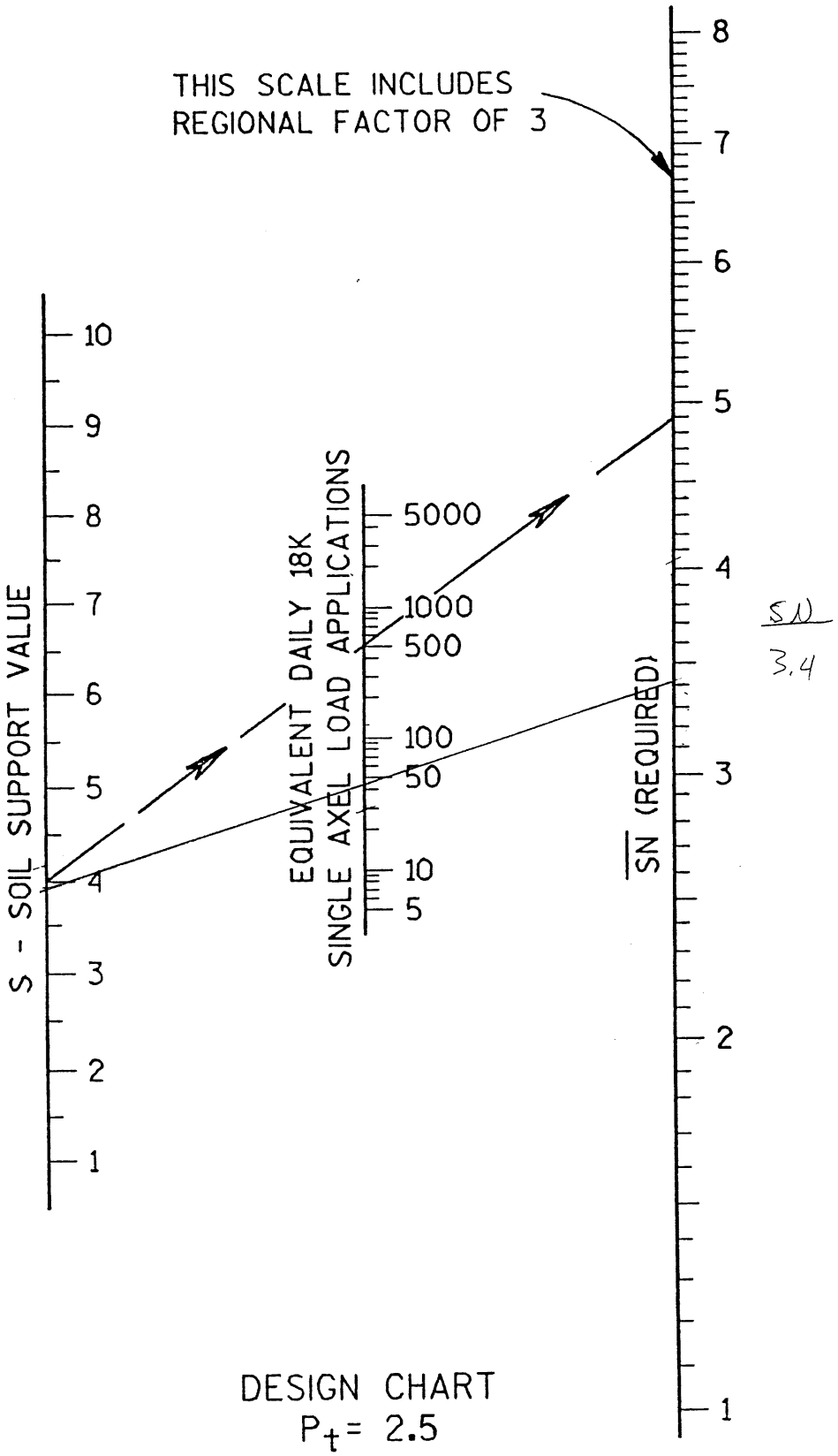
ALTERNATE DESIGNS - SN

	Surface Mill + overlay (~~10~~ 2)		Compromise Shoulder design (~~2~~)	
Bituminous Concrete	2 " X 0.44 =	0.88	3½ " X 0.44 =	1.5
Existing AC ~~Bituminous Road Mix~~	4 " X ~~0.20~~ 0.35 =	1.4	_____ " X 0.20 =	_____
Bituminous Base Course (Hot Mix)	_____ " X 0.34 =	_____	_____ " X 0.34 =	_____
Bituminous Stabilized Base	_____ " X ___ =	_____	_____ " X ___ =	_____
P.C. Stabilized Base	_____ " X ___ =	_____	_____ " X ___ =	_____
Gravel or Crushed Stone Base	11 " X ~~0.14~~ 0.10 =	1.1	11½ " X ~~0.14~~ 0.10 =	1.15
Granular or Subbase	_____ " X ___ =	_____	_____ " X ___ =	_____
_____	_____ " X ___ =	_____	_____ " X ___ =	_____
	SN =	3.38	SN =	2.65

COVERS 25% 18Kip WHEELOADS

(Show other alternates on attached sheet)

Recommended Alternate _____



DESIGN CHART
$P_t = 2.5$

Date: 05/04/92
From: LARY HYLAND HYLANL - HFRC
To: Richard Gosnell GOSNER - HFRC
Subject: Proj. 8600-07-00, STH 178
Reference: Note attached below

The Proj. No. should have been 8600-02-61. Sorry!

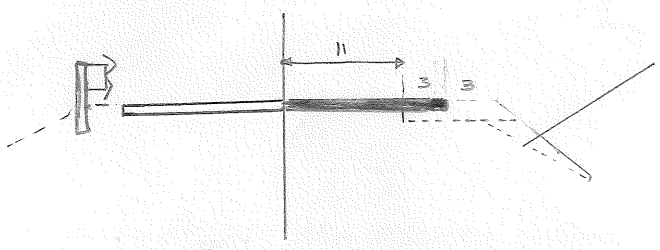
---------- ATTACHED NOTE ----------

Date: 05/01/92
From: LARY HYLAND HYLANL - HFRC
To: Richard Gosnell GOSNER - HFRC
Subject: Proj. 8600-07-00, STH 178

I got up there today to look. Here's the way I see it:

1. There are stretches that definitely need milling before paving. (In fact if this weren't a Maintain Only road I'd say protions should be rebuilt). Other portions could be milled as a first choice but we could easily live without. Still other sections don't need milling at all. This is an unusually variable piece of road - I suppose, because of the maintenence-only approach.

2. The need to mill, however, could be rethought if your survey indicates crown problems.



ASPHALT SAME		$81200
MILLING SAME		$151,000
BASE ADDITIONAL	2100 * 9 =	$19,000
SHOULDER CUT		= 10,000
		125 200
MISC DRAINAGE ITEMS ETC.		25,000
		$150,000

SOME CUTS - SAND
BORROW - SAND

5"
11"

— OFF OLD ROAD CORE COMPLETELY

5½
12" BASE

(5)
(12)

Misc.

OFFICE MEMO AD-2

To	Date	Time
From		☐ Please Call ☐ Returning Call ☐ Will Call
Phone	Taken By	

☐ Comment	☐ For Your Inf.	☐ Prepare Reply	☐ Return
☐ Route	☐ Approve/Sign	☐ Take Action	☐ File

#1 1.46 Worth of y

#2 3.29

#3 5.18

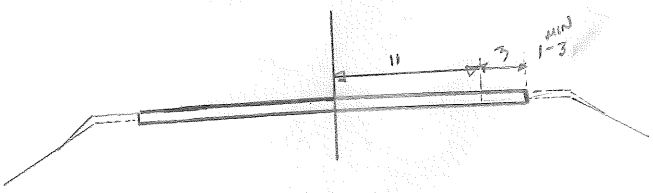
#4 6.55

#5 9.66

STH 178

No. of Copies:	☐ Typing	☐ Photocopy	☐ Copy Center	☐ Copy from Microfilm

Date Need	Time Need			
		☐ Rough ☐ Final	☐ Double ☐ Single	☐ Original Document ☐ Revised Document



MILL OFF 2" @ 22' wide
REPAVE 3½"

MILLING 2": $\frac{(23')(2")(110)(5280)}{18000} = 1484$ say 1500 TON/MILE

ASPHALT 3½": MAT'L $\frac{(28')(3.5")(112)(5280)}{18000} = 3220$ TONS/MILE

AC $3220 * .058 = 187$ TONS/MILE

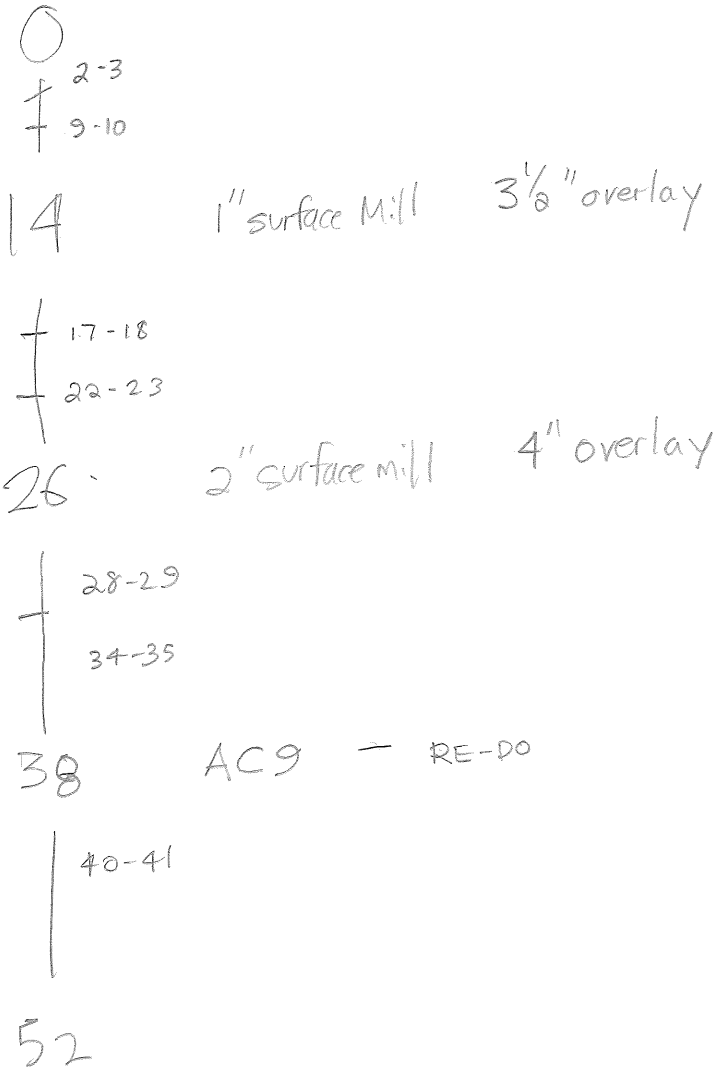
BASE 3"? $\frac{.25 * 6' * 5280' * 2.25}{27} = 660$ TONS/MILE

COST/MILE

MILLING	1500 TON * $10/TON		= $15,000
ASPHALT	MAT'L 3220 TONS *	16.50	= $53,130
	AC 187 TONS *	150	= 28,050
BASE	660 TONS * $	9.00	= 5940

$102,120/MILE

#2 A/B/S & #3


0
2-3
9-10
14
1" surface Mill
3½" overlay
17-18
22-23
26
2" surface mill
4" overlay
28-29
34-35
38
AC9 – RE-DO
40-41
52

existing Structure

5" Asphalt

5" BASE

M & Relay 6"

6" * .25 = 1.25

5" * .10 = 0.50

1.75

Target ~~3.5~~ 3.4

4.2"

4"

~~4000~~

M & Relay 4" Mat

cost/mile 4000 * $25/ton = $100,000

$15,000

M & R

115,000

SPBG, BASE 35 tons/mile *

155,000 mile

2 MILLION

1½" mill & raise | Mill out 2"

SURFACE MILL

2 PASS Mat

3½"

Superpave minimum 2 lift

2000 TON/MILE

$15,000

3500 * 25 = 87,500

102,500

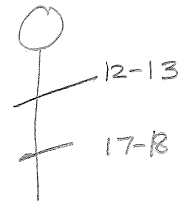
Misc 20% = $20,000

$125,000

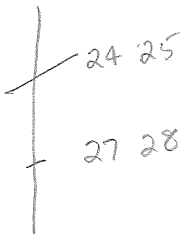
1 pass (1 million)

1.4 MILL

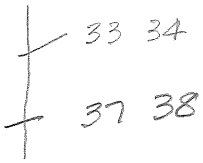
PC



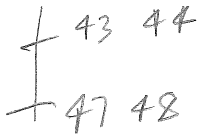
20 5% patch



30 5% patch 3" overlay



40 mill off 3" 2% patch 3" overlay



50

PC-PMDSS

178 - Cty. Y - Cornell

USE THIS FOR LAYER & BASE INFO ONLY

PDI & PSI INFO OUTDATED

```
Section ID: 6-09-178-30 (Sect.#207)  Length: 10.28 mi. Type: flexible
CHIP_FLS-CORNELL/JIM_FALLS-STH_64              PSI=2.00  PDI= 77.9
Possible treatments     Estimated $/mi.
85% -->     7               135000    +/-=+/- one sect.  c=another section
70% -->     5                40000    s=see these segments  q=quit showme
50% -->     4                30000    d=prob/tmt defs  Which?(+,-,c,s,q,d):
Emphasis of this section = maint.|  Segments:                          trtmt
ADT= 790 ('84)  Truck%= 7        |     ID-type yr PSI PDI  problems  lo..hi
                                 |  ------------------------------------------
Treatment.......Xlength it fixes |   1 13240-1 81 2.6  63   3  1  0   4.. 4
-------------------------------- |   2 13250-1 81 2.6  80   1  0  0   1.. 2
 0  do nothing             0.0   |   3 13260-2 79 1.9  98   1  0  0   4.. 5
 1  spot repair            4.5   |   4 13270-2 79 2.3  79   1  0  0   4.. 4
 2  crack filling          9.1   |   5 13280-2 84 1.4  95   1  0  0   7.. 7
 3  seal coat             27.3   |   6 13290-2 84 1.8  93   4  1  0   8.. 9
 4  cold recycle          63.6   |   7 13300-2 79 2.0  38   1  2  0   3.. 3
 5  maint. overlay        81.8   |   8 13310-2 83 1.8  94   1  0  0   4.. 5
 6  program thin overlay  81.8   |   9 13320-2 80 1.5  78   1  0  0   4.. 5
 7  thick overlay         90.9   |  10 13330-2 81 2.1  59   1  0  0   3.. 3
 8  mill+overlay         100.0   |  11 13340-2 84 2.1  95   1  0  0   4.. 5
 9  (not applicable)       -     |
10  reconstruct           100.0   |
                                 |
                                 |
```

```
SEGMENT HISTORY SCREEN
SegID:13240    No. 1 of 11 Sect # 60917830: CHIP_FLS-CORNELL/JIM_FALLS-STH_64

Last 12 yrs surface history...     Cross-Section(up to 10 layers)...
Yr  trtmt     PSI(s)  PDI(s)       Layr# Yr. Type        Thick.    Prev.Lyr.Tmt.
89                                    1  81   SglAgg     01.5"        -
88                                    2  63   SglAgg     01.5"        -
87          2.6                       3  50   SglAgg     01.5"        -
86                    63              4
85          2.5                       5
84                                    6
83          1.8                       7
82                                    8
81          2.2                       9
80                                   10
79                                Base: 11" crushed gravel no stab.
78                                Sub Base:   no subbase recorded no stab.
                                  Soils: somewhat sandy
```

```
                                    Struct Num (with soil, w/o PCC)=   7.15
 --Widths---                        Struct Num (with soil, w/o PCC)=   7.15
  LS PVMT RS        d=change display mode to decisions
   2  22   2        +/-= next/prev. segment in this section (this is #1 of 11)
  Roadway:  28      s= see the deficiency Section again
                    c= Choose another section
                            Enter your choice (d,+/-,s,c):

SEGMENT HISTORY SCREEN
SegID:13250    No. 2 of 11 Sect # 60917830: CHIP_FLS-CORNELL/JIM_FALLS-STH_64

Last 12 yrs surface history...      Cross-Section(up to 10 layers)...
Yr  trtmt     PSI(s)  PDI(s)        Layr# Yr. Type        Thick.   Prev.Lyr.Tmt.
89                                     1  91   SglAgg     01.5"        -
88                                     2  63   SglAgg     01.5"        -
87          2.6                        3  50   SglAgg     01.5"        -
86                    80               4
85          1.9                        5
84                                     6
83          1.6                        7
82                                     8
81          1.9                        9
80                                    10
79                                  Base: 11" crushed gravel no stab.
78                                  Sub Base:   no subbase recorded no stab.
                                    Soil:  poor draining
 --Widths---                        Struct Num (with soil, w/o PCC)=   6.85
  LS PVMT RS        d=change display mode to decisions
   2  22   2        +/-= next/prev. segment in this section (this is #2 of 11)
  Roadway:  28      s= see the deficiency Section again
                    c= Choose another section
                            Enter your choice (d,+/-,s,c):

SEGMENT HISTORY SCREEN
SegID:13260    No. 3 of 11 Sect # 60917830: CHIP_FLS-CORNELL/JIM_FALLS-STH_64

Last 12 yrs surface history...      Cross-Section(up to 10 layers)...
Yr  trtmt     PSI(s)  PDI(s)        Layr# Yr. Type        Thick.   Prev.Lyr.Tmt.
89                                     1  84   SglAgg     01.5"        -
88                                     2  63   SglAgg     01.5"        -
87          1.9                        3  50   SglAgg     01.5"        -
86                    98               4
85          1.6                        5
84                                     6
83          2.0                        7
82                                     8
81          2.2                        9
80                                    10
79                                  Base: 11" crushed gravel no stab.
78                                  Sub Base:   no subbase recorded no stab.
                                    Soil:  well draining
 --Widths---                        Struct Num (with soil, w/o PCC)=   7.15
  LS PVMT RS        d=change display mode to decisions
   2  22   2        +/-= next/prev. segment in this section (this is #3 of 11)
  Roadway:  28      s= see the deficiency Section again
                    c= Choose another section
                            Enter your choice (d,+/-,s,c):

SEGMENT HISTORY SCREEN
SegID:13270    No. 4 of 11 Sect # 60917830: CHIP_FLS-CORNELL/JIM_FALLS-STH_64

Last 12 yrs surface history...      Cross-Section(up to 10 layers)...
Yr  trtmt     PSI(s)  PDI(s)        Layr# Yr. Type        Thick.   Prev.Lyr.Tmt.
89                                     1  84   SglAgg     01.5"        -
88                                     2  63   SglAgg     01.5"        -
87          2.3                        3  50   SglAgg     01.5"        -
86                    78               4
```

```
85          1.5                      5
84                                   6
83          1.5                      7
82                                   8
81          2.0                      9
80                                  10
79                                  Base: 11" crushed gravel no stab.
78                                  Sub Base:   no subbase recorded no stab.
                                    Soil:  well draining
 --Widths---                        Struct Num (with soil, w/o PCC)=   7.15
  LS PVMT RS        d=change display mode to decisions
   2  22   2        +/-= next/prev. segment in this section (this is #4 of 11)
  Roadway:  28      s= see the deficiency Section again
                    c= Choose another section
                            Enter your choice (d,+/-,s,c):

SEGMENT HISTORY SCREEN
SegID:13280    No. 5 of 11 Sect # 60917830: CHIP_FLS-CORNELL/JIM_FALLS-STH_64

Last 12 yrs surface history...      Cross-Section(up to 10 layers)...
Yr  trtmt     PSI(s)  PDI(s)        Layr# Yr. Type        Thick.   Prev.Lyr.Tmt.
89                                     1  84   SglAgg     01.5"        -
88                                     2  63   SglAgg     01.5"        -
87          1.4                        3  50   SglAgg     01.5"        -
86                    80               4
85          1.5                        5
84                                     6
83          1.6                        7
82                                     8
81          1.6                        9
80                                    10
79                                  Base: 11" crushed gravel no stab.
78                                  Sub Base:   no subbase recorded no stab.
                                    Soil:  well draining
 --Widths---                        Struct Num (with soil, w/o PCC)=   7.15
  LS PVMT RS        d=change display mode to decisions
   2  22   2        +/-= next/prev. segment in this section (this is #5 of 11)
  Roadway:  28      s= see the deficiency Section again
                    c= Choose another section
                            Enter your choice (d,+/-,s,c):

SEGMENT HISTORY SCREEN
SegID:13290    No. 6 of 11 Sect # 60917830: CHIP_FLS-CORNELL/JIM_FALLS-STH_64

Last 12 yrs surface history...      Cross-Section(up to 10 layers)...
Yr  trtmt     PSI(s)  PDI(s)        Layr# Yr. Type        Thick.   Prev.Lyr.Tmt.
89                                     1  84   SglAgg     01.5"        -
88                                     2  63   SglAgg     01.5"        -
87          1.5                        3  50   SglAgg     01.5"        -
86                    93               4
85          1.6                        5
84                                     6
83          1.6                        7
82                                     8
81          1.9                        9
80                                    10
79                                  Base: 11" crushed gravel no stab.
78                                  Sub Base:   no subbase recorded no stab.
                                    Soil:  well draining
 --Widths---                        Struct Num (with soil, w/o PCC)=   7.15
  LS PVMT RS        d=change display mode to decisions
   2  22   2        +/-= next/prev. segment in this section (this is #6 of 11)
  Roadway:  28      s= see the deficiency Section again
                    c= Choose another section
                            Enter your choice (d,+/-,s,c):
```

```
SEGMENT HISTORY SCREEN
SegID:13300    No. 7 of 11 Sect # 60917830: CHIP_FLS-CORNELL/JIM_FALLS-STH_64

Last 12 yrs surface history...     Cross-Section(up to 10 layers)...
Yr  trtmt     PSI(s)  PDI(s)       Layr# Yr. Type        Thick.   Prev.Lyr.Tmt.
89                                    1  79   ColdMx     01.5"        -
88                                    2  63   SglAgg     01.5"        -
87           2.0                      3  50   SglAgg     01.5"        -
86                    38              4
85           1.9                      5
84                                    6
83           1.7                      7
82                                    8
81           2.1                      9
80                                   10
79                                 Base: 11" crushed gravel no stab.
78                                 Sub Base:   no subbase recorded no stab.
                                   Soil:  well draining
 --Widths---                       Struct Num (with soil, w/o PCC)=   6.85
  LS PVMT RS        d=change display mode to decisions
   2  22   2        +/-= next/prev. segment in this section (this is #7 of 11)
  Roadway:  28      s= see the deficiency Section again
                    c= Choose another section
                            Enter your choice (d,+/-,s,c):

SEGMENT HISTORY SCREEN
SegID:13310    No. 8 of 11 Sect # 60917830: CHIP_FLS-CORNELL/JIM_FALLS-STH_64

Last 12 yrs surface history...     Cross-Section(up to 10 layers)...
Yr  trtmt     PSI(s)  PDI(s)       Layr# Yr. Type        Thick.   Prev.Lyr.Tmt.
89                                    1  80   ColdMx     01.5"        -
88                                    2  75   SglAgg     01.5"        -
87           1.8                      3  50   SglAgg     01.5"        -
86                    94              4
85           1.9                      5
84                                    6
83           1.7                      7
82                                    8
81           2.0                      9
80                                   10
79                                 Base: 11" crushed gravel no stab.
78                                 Sub Base:   no subbase recorded no stab.
                                   Soil:  well draining
 --Widths---                       Struct Num (with soil, w/o PCC)=   6.85
  LS PVMT RS        d=change display mode to decisions
   2  22   2        +/-= next/prev. segment in this section (this is #8 of 11)
  Roadway:  28      s= see the deficiency Section again
                    c= Choose another section
                            Enter your choice (d,+/-,s,c):

SEGMENT HISTORY SCREEN
SegID:13320    No. 9 of 11 Sect # 60917830: CHIP_FLS-CORNELL/JIM_FALLS-STH_64

Last 12 yrs surface history...     Cross-Section(up to 10 layers)...
Yr  trtmt     PSI(s)  PDI(s)       Layr# Yr. Type        Thick.   Prev.Lyr.Tmt.
89                                    1  79   ColdMx     01.5"        -
88                                    2  63   SglAgg     01.5"        -
87           1.5                      3  50   SglAgg     01.5"        -
86                    78              4
85           1.5                      5
84                                    6
83           2.0                      7
82                                    8
81           2.3                      9
80                                   10
79                                 Base: 11" crushed gravel no stab.
```

```
78                                Sub Base:   no subbase recorded no stab.
                                  Soil:  well draining
 --Widths---                      Struct Num (with soil, w/o PCC)=   6.85
  LS PVMT RS          d=change display mode to decisions
   2  22   2          +/-= next/prev. segment in this section (this is #9 of 11)
  Roadway:  28        s= see the deficiency Section again
                      c= Choose another section
                              Enter your choice (d,+/-,s,c):

SEGMENT HISTORY SCREEN
SegID:13330    No.10 of 11 Sect # 60917830: CNIP_FLS-CORNELL/JIM_FALLS-STH_64

Last 12 yrs surface history...    Cross-Section(up to 10 layers)...
Yr  trtmt     PSI(s)  PDI(s)      Layr# Yr. Type        Thick.   Prev.Lyr.Tmt.
89                                   1  84   SglAgg     01.5"        -
88                                   2  63   SglAgg     01.5"        -
87          2.1                      3  50   SglAgg     01.5"        -
86                    59             4
85          2.0                      5
84                                   6
83          1.6                      7
82                                   8
81          1.9                      9
80                                  10
79                                Base: 11" crushed gravel no stab.
78                                Sub Base:   no subbase recorded no stab.
                                  Soil:  well draining
 --Widths---                      Struct Num (with soil, w/o PCC)=   7.15
  LS PVMT RS          d=change display mode to decisions
   2  22   2          +/-= next/prev. segment in this section (this is #10 of 11)
  Roadway:  28        s= see the deficiency Section again
                      c= Choose another section
                              Enter your choice (d,+/-,s,c):

SEGMENT HISTORY SCREEN
SegID:13340    No.11 of 11 Sect # 60917830: CNIP_FLS-CORNELL/JIM_FALLS-STH_64

Last 12 yrs surface history...    Cross-Section(up to 10 layers)...
Yr  trtmt     PSI(s)  PDI(s)      Layr# Yr. Type        Thick.   Prev.Lyr.Tmt.
89                                   1  84   SglAgg     01.5"        -
88                                   2  63   SglAgg     01.5"        -
87          2.1                      3  50   SglAgg     01.5"        -
86                    95             4
85          2.1                      5
84                                   6
83          1.3                      7
82                                   8
81          1.7                      9
80                                  10
79                                Base: 11" crushed gravel no stab.
78                                Sub Base:   no subbase recorded no stab.
                                  Soil:  well draining
 --Widths---                      Struct Num (with soil, w/o PCC)=   7.15
  LS PVMT RS          d=change display mode to decisions
   2  22   2          +/-= next/prev. segment in this section (this is #11 of 11)
  Roadway:  28        s= see the deficiency Section again
                      c= Choose another section
                              Enter your choice (d,+/-,s,c):
```

STH 178

CTH y East = 0.00

① 1.2 — 1.9

② 3.0 — 3.4

③ 5.0 — 6.0

④ 6.4 — 7.2

⑤ 9.0 — 10.0

4 miles

4 spots (300-400)

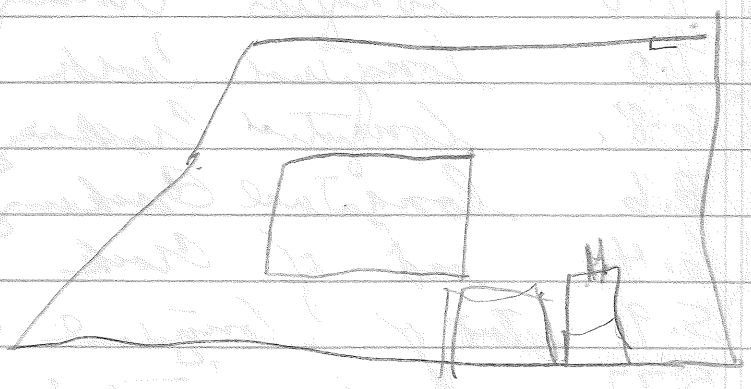
178 Gilbert Falls bridge to 64

~~1977~~

1 mile longitudal cracking
1.50 - 1.8 longitudal Cracking
(1) 3.0 - Rutting
3.3 longitudal Cracking
4.7 longitudal Cracking
5.0
(2) 5.5 Caboon bridge
5.84 blacktop patches
5.91 blacktop patches
6.25 longitudal Cracking
(3) 6.50 longitudal Cracking
7.0 end of longitudal cracking
8.0 longitudal Cracking
10.47 64 + 178
9.80 longitudal Cracking
9.70 - 9.50 longitudal Cracking
(4) 8.30 longidal Cracking along wall
8.0 longitdal cracking
7.0 longitudal Crack + Rutting
6.8. longitudal Cracking
(3) 6.6 longitudal Cracking
6.4 end of Crack
5.9 start of longitudal Cracks
(2) 5.77 end of longitdal Cracks
5.5 to 5.0 longitdal + rutting
(1) 3.35 longitudal Cracking to
3.0 Rutting

Hampton -

244-9400



19. Asphaltic Base Course, Item 90006A

A. Description. This work shall consist of placing the stockpiled milled asphaltic pavement as base course, at the locations shown on the plans or as directed by the engineer. Removal of the material and stockpiling will be paid for under the item of Removing Asphaltic Surface, Milling.

B. Construction Methods. Work shall be performed using methods described in section 304 of the Standard Specifications except that the milled asphaltic pavement shall be processed so that 95% will pass a 50 mm sieve.

C. Method of Measurement. Asphaltic Base Course will be measured as provided in the contract by the megagram. The quantity to be measured for payment shall be amount of material required and incorporated into the work

D. Basis of Payment. Asphaltic Base Course measured as provided above shall be paid for at the contract unit price per megagram which payment shall be in full for hauling, placing, and compacting; for maintaining; for preparing foundation; and for furnishing all labor, tools, and equipment necessary to complete the work.

20. Crushed Aggregate Base Course, Trench, Item 90006B

A. Description. This work shall consist of placing crushed aggregate base course over the trenches for the pipe culvert installations.

B. Construction Methods. Work shall be performed using methods described in section 304 of the Standard Specifications and the Detail Drawings shown in the plans.

C. Method of Measurement. Crushed Aggregate Base Course, Trench will be measured as provided in the contract by the megagram. The quantity to be measured vor payment shall be the amount of material required and incorporated into the work.

D. Basis of Payment. Crushed Aggregate Base Course, Trench measured as provided above shall be paid of at the contract unit price per megagram which payment shall be in full for hauling, placing and compacting; for maintaining: for preparing foundation and for furnishing all labor, tools ,and equipment necessary to complete the work.

21. Shoulder Coring, Item 90012A

A. Description. This work shall consist of stripping the sod from the existing shoulder and/or removing the existing turf shoulder to an average depth of 150 mm unless otherwise directed by the engineer. The excavated material shall be placed on the existing unstripped inslopes to shape them to the desired slope as shown in the special details of the plan or established by the engineer. The remaining existing crushed aggregate base course shall remain in place.

B. Construction Methods. The construction methods for shoulder coring shall comply with Section 205.3 of the 1996 Standard Specifications for Highway and Structure Construction. Shoulder Coring shall be done prior to the milling and relaying existing asphaltic pavement.

C. Method of Measurement. All excavation and grading, actually performed and accepted as herein provided and within the specified limits, will be measured in station units of 40 meters along the roadway centerline for each side of the roadway where the work of Shoulder Coring occurs.

D. Basis of Payment. Shoulder Coring, measured as provided above, will be paid for at the contract unit price per 40M. That price shall be payment in full for excavating, placing as fill, and compacting to the specified limits and elevations as shown in the plan. Additional fill required to complete the slopes will be paid for under the item of Borrow Excavation, Common Excavation or Ditching.
(090189)

22. Ditching, Item 90012B

A. Description. This work shall consist of the grading new ditches or shaping existing ditches at the locations as shown on the plans. All ditches shall drain in the same direction as the existing ditches unless otherwise directed by the engineer.

B. Construction Methods. The construction methods for ditching shall comply with Section 205.3 of the 1996 Standard Specifications for Highway and Structure Construction.

C. Method of Measurement. All excavation performed and accepted as herein provided and within the specified limits will be measured in station units of 40 meters along the roadway centerline for each side of the roadway where the work of Ditching occurs.

D. Basis of Payment. Ditching, measured as provided above, will be paid for at the contract unit price per 40M. This price shall be payment in full for excavating, hauling, placing as fill and compacting to the specified limits and elevations as shown in the plan, and for disposing of surplus and unsuitable material. Additional fill required to complete the grading will be paid for under the item of Borrow Excavation. Backslope grading in excess of 2 M in height measured from the bottom of the ditch shall be paid for as Common Excavation. Finishing items will be paid for separately.

23. Mill and Relay Asphaltic Pavement, Item 90358

A. Description. This work shall consist of constructing base course utilizing in-place milling and relaying of the existing asphaltic surface over the roadbed as shown on the plans and as hereinafter provided.

B. Construction Methods. The existing asphaltic surface shall be milled to the depth shown on the plans and to a maximum size of 37.5 mm. The milling machine shall be equipped with electronic devices which will provide accurate depth, grade and slope control.

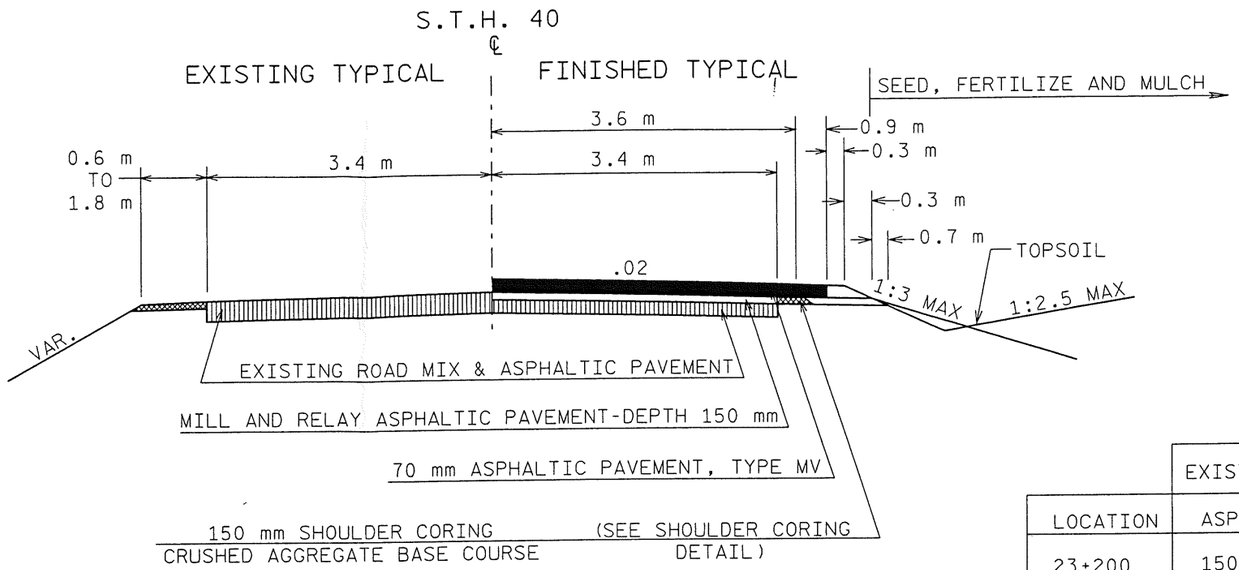
NOTE:

70mm ASPHALTIC CONCRETE PAVEMENT, TYPE MV TO BE PLACED IN TWO LIFTS

THE SURFACE COURSE OF 30 mm ASPHALTIC CONCRETE PAVEMENT, TYPE MV WILL BE PLACED UNDER CONTRACT 8580-00-71.

IN AREAS SPECIFIED IN THE MISCELLANEOUS QUANTITIES AND AT THE DIRECTION OF THE PROJECT ENGINEER, CRUSHED AGGREGATE BASE COURSE SHALL BE PLACED ON THE PAVEMENT JUST PRIOR TO THE MILL AND RELAY OPERATION TO HELP ADJUST PROFILE IRREGULARITIES.

EXISTING ENDSLOPES DO NOT NEED TO BE STRIPPED.

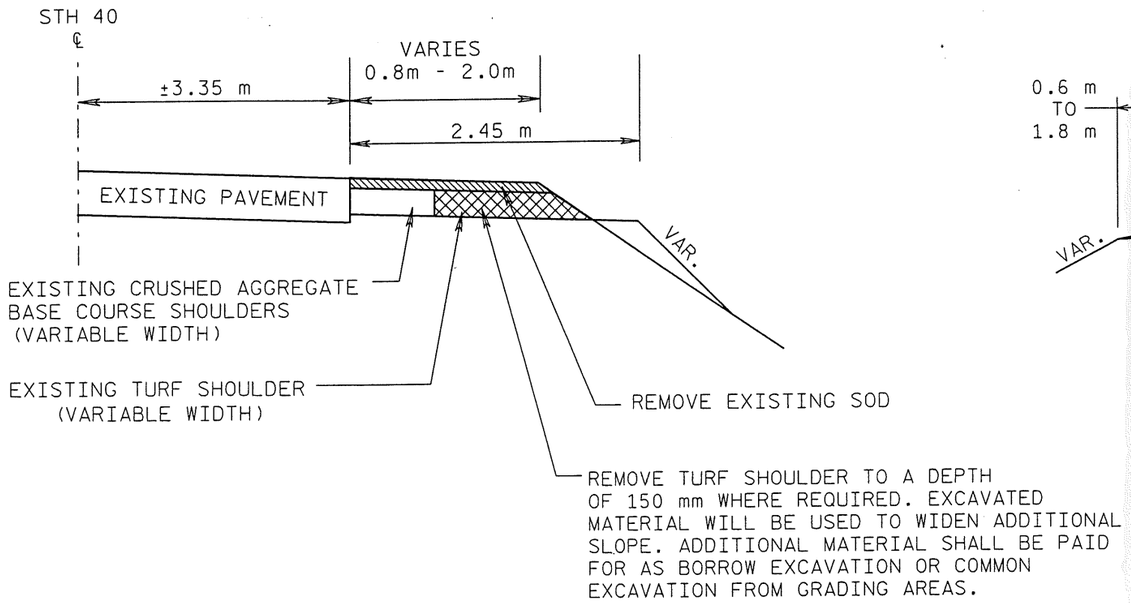


TYPICAL SECTION

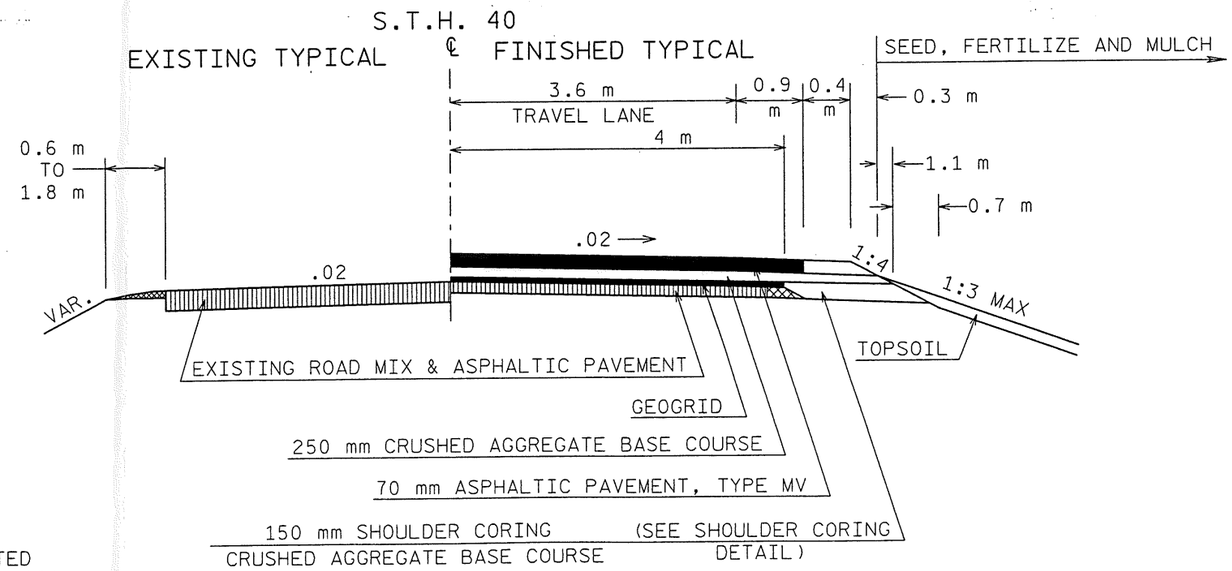
S.T.H. 40
STA. 22+080 TO 22+245
STA. 28+800 TO 30+760
STA. 31+080 TO 32+520
STA. 33+600 TO 34+520

LOCATION	EXISTING DEPTH (mm) ASPHALT	ROAD MIX
23+200	150	150
23+690	175	200
24+815	175	175
26+590	175	175
28+035	150	150
29+000	150	300
29+320	125	125
30+930	175	200
32+060	150	150
32+220	175	225
331+85	200	200
33+665	200	300

SHOULDER CORING DETAIL



NOTE: THIS OPERATION MUST BE COMPLETED PROIR TO THE MILL & RELAY OPERATION.



TYPICAL SECTION

S.T.H. 40
STA. 32+520 TO 33+600

NOTE:
GEOGRID SHALL BE PLACED DIRECTLY ON EXISTING PAVEMENT AND COVERED WITH 250 mm OF CRUSHED AGGREGATE BASE COURSE.

TYPICAL SECTIONS - S.T.H. 40	SCALE: 1:	HWY: S.T.H. 40	COUNTY: CHIPPEWA	STATE PROJECT NO: 8580-01-70	SHEET NO: .	M

FILE NAME: D6 8580010I:8580TYP.DGN REV. DATE: 9-13-99 leo PLOT NAME: 8580TYP3d.I WisDOT: MSHT20

PLOT SCALE:

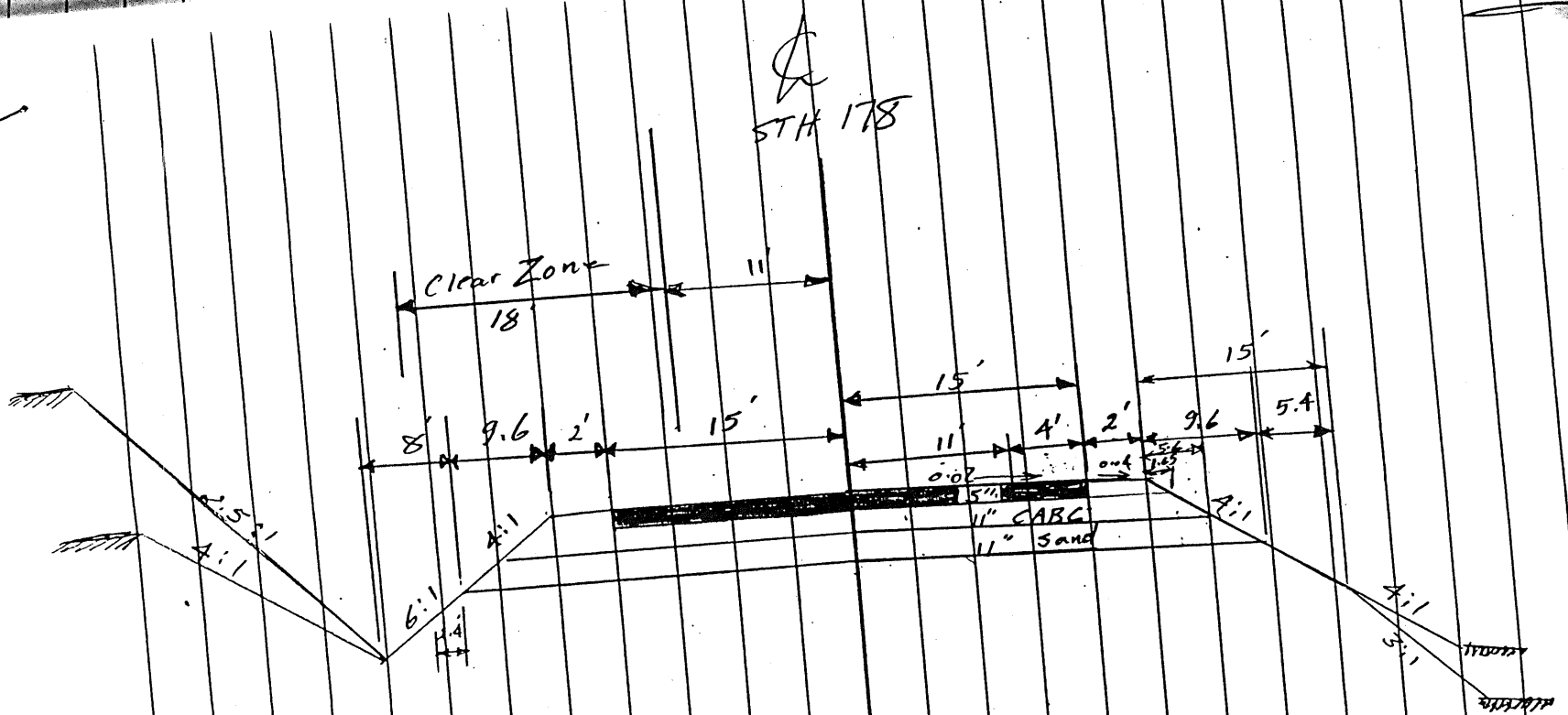
ORIGINATOR: DIST. 6, EAU CLAIRE, L. OLSON

LEVELS ON • 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63

SHEET 1

Field Review 7-14

- South 2½-3 miles could still be a P&R - North 4 combinations possible
- existing SHR 2-5' wide
- it still appears that there is other options
  - 3 curves around 35 mph speed



TYPICAL SECTION – Relocation Areas.

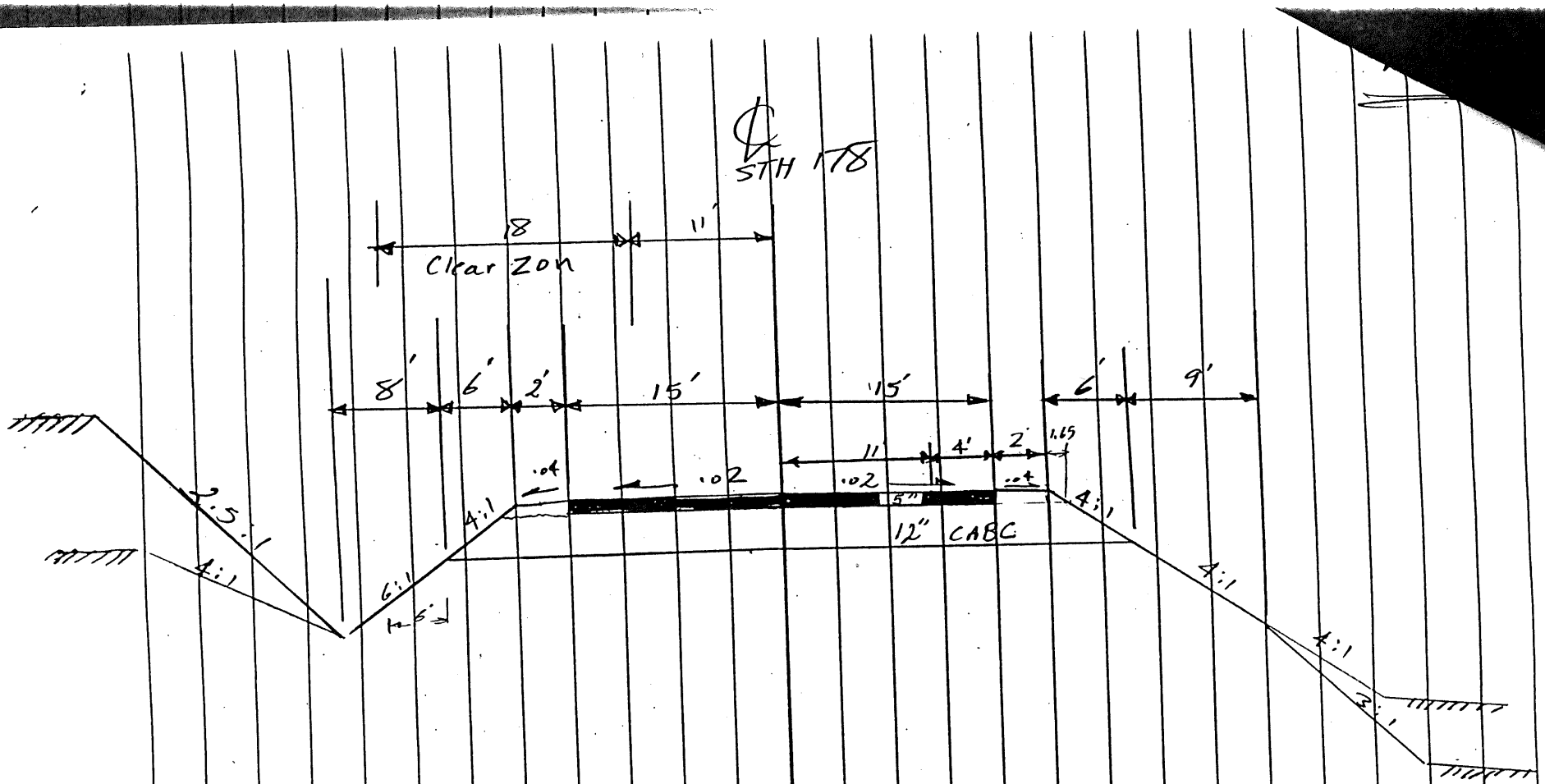
Asphl. cont. Pav't, M.V. = $\frac{[(110 \times 5) + 20] \times 30' \times 100'}{18,000}$ = 1.95 TON/STA.

Crushed Agg. Base = $\frac{100' \times 39.6' \times .92'}{27} \times 2$ = 270 TON/STA.

Crushed Agg (Shldrs) = $\left(\frac{100' \times 2.8' \times .42'}{27} \times 2.25\right) \times 2$ = 19.6 TON/STA.

+ $\frac{100' \times 49.2' \times .92'}{27}$ = 167 C.Y./STA. X 1.15 = 193 C

Total = $37,134,000



TYPICAL SECTION — VERTICAL PROFILE CORRECTIONS

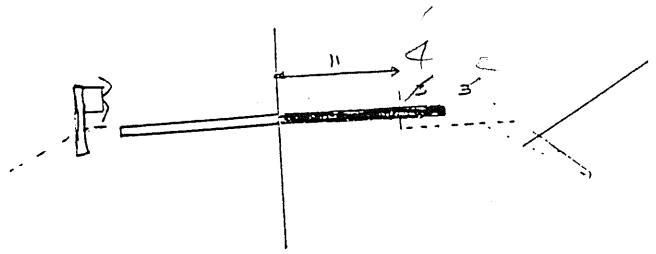
Asph. Conc. Pavt Type MV = $\frac{[(100 \times 5) + 20] \times 30 \times 100'}{18,000}$ = 9.5 TON/STA.

Crushed Agg. Base Course = $\left[\frac{100 \times 41.7 \times 1.1}{27}\right] \times 2$ = 3.09 TON/STA.

(1 1 1 . .) × 100 × 2.8 × 0.42' × 2.25) × 2 = 20 TON/STA.

10121 — # 3,434,000

B.C. wide.



$ 150,000 / mile

ASPHALT SAME		$81200
MILLING SAME		$15,000
BASE ADDITIONAL	2100 @ 9 =	$19,000
SHOULDER CUT	=	10,000
		125 200
MISC DRAINAGE ITEMS ETC.		25,000
		$150,000

SOME CUTS - SAND
BORROW - SAND
5"
11"

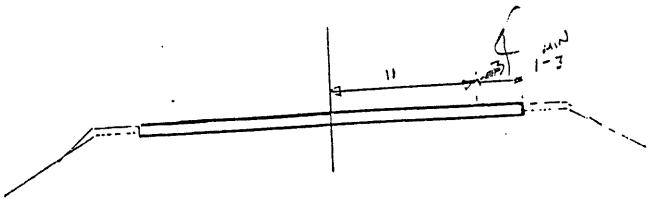
_ OFF OLD ROAD CORE COMPLETELY

5½
12" BASE

5
12

Resurfacing

$ 125,000/mile



MILL OFF 2" @ 22' wide
REPAVE 3½"

MILLING 2": $\frac{(23')(2")(110)(5280)}{18000}$ = 1484 say 1500 TON/MILE

ASPHALT 3½": MAT'L $\frac{(28')(3.5")(112)(5280)}{18000}$ = 3220 TONS/MILE

AC 3220 * .058 = 187 TONS/MILE

BASE 3"? $\frac{.25 * 6' * 5280'}{27} * 2.25$ = 660 TONS/MILE

COST/MILE

MILLING	1500 TON * $10/TON	= $15,000
ASPHALT	MAT'L 3220 TONS * 16.50	= $53,130
	AC 187 TONS * 150	= 28,050
BASE	660 TONS * $9.00	= 5940
		$102,120/MILE
MISC.		23,000

8600-02-01

STH 178 JIM FALLS - CTHR

ESTIMATED GRID LOCATIONS – (FIELD REVIEW REQUIRED TO FINALIZE LOCATIONS)

		L.F.		
	± STA 868+00 to ± STA 880+50	1250	LT & RT	PDR DETAIL #3
PLACE UNDER BASE COURSE	± STA 900+50 to ± STA 903+00	250	FINISHED SHR. PT to FINISHED SHR PT.	PIPE REPLACEMENT ???
	± STA 941+50 to ± STA 944+50	300	FINISHED SHR. PT. to FINISHED SHR PT	PIPE REPLACEMENT ??? PROFILE ADJUSTMENT ???
	± STA 1032+00 to ± STA 1060+50	2850	LT	PDR DETAIL #4
	± STA 1080+50 to ± STA 1096+00	1550	LT & RT	PDR DETAIL #3
	± STA 1143+00 to ± STA 1162+50	1950	LT & RT	PDR DETAIL #3

UNDISTRIBUTED QUANTITY 10-20%

ORIGINAL GIVEN TO KARL KOPACZ 11/07/00

RWL

NOTE: ~~THESE LOCATIONS WERE BASED~~ ON MEMORY OF FIELD REVIEW 1999.

RWL

8600-02-01

STH 178 _IM FALLS - CTH R

ESTIMATED GRID LOCATIONS – (FIELD REVIEW REQUIRED TO FINALIZE LOCATIONS)

		L.F.		
	± STA 868+00 to ± STA 880+50	1250	LT & RT	PDR DETAIL #3
PLACE UNDER BASE COURSE	± STA 900+50 to ± STA 903+00	250	FINISHED SHR. PT to FINISHED SHR PT.	PIPE REPLACEMENT ???
PLACE UNDER BASE COURSE	± STA 941+50 to ± STA 944+50	300	FINISHED SHR. PT. to FINISHED SHR PT	PIPE REPLACEMENT ??? PROFILE ADJUSTMENT ???
	± STA 1032+00 to ± STA 1060+50	2850	LT	PDR DETAIL #4
	± STA 1080+50 to ± STA 1096+00	1550	LT & RT	PDR DETAIL #3
	± STA 1143+00 to ± STA 1162+50	1950	LT & RT	PDR DETAIL #3

UNDISTRIBUTED QUANTITY 10-20%

ORIGINAL GIVEN TO KARL KOPACZ 11/07/00

RWL

NOTE: ~~THESE LOCATIONS WERE BASED~~ ON MEMORY OF FIELD REVIEW 1999.

RWL

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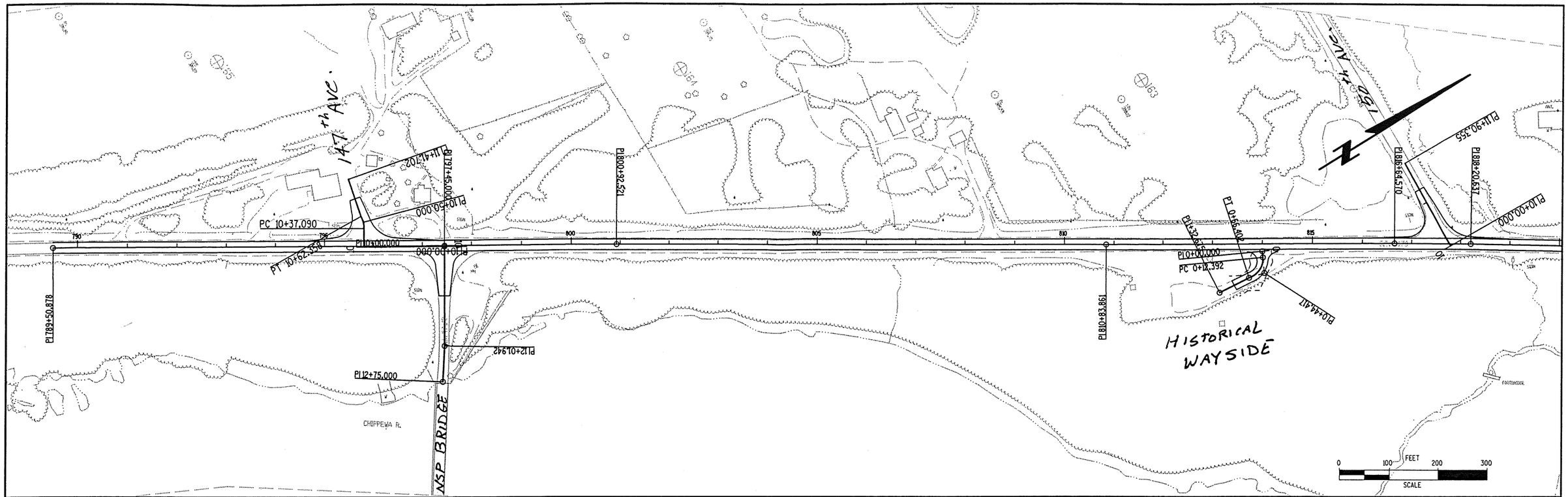

STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E

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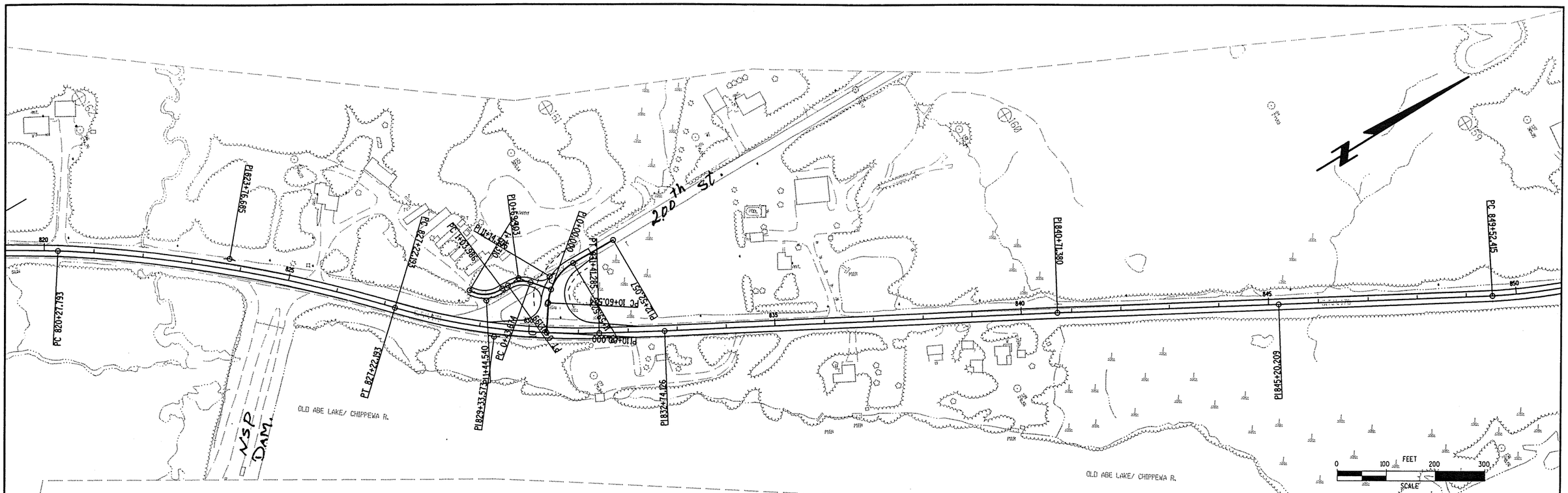

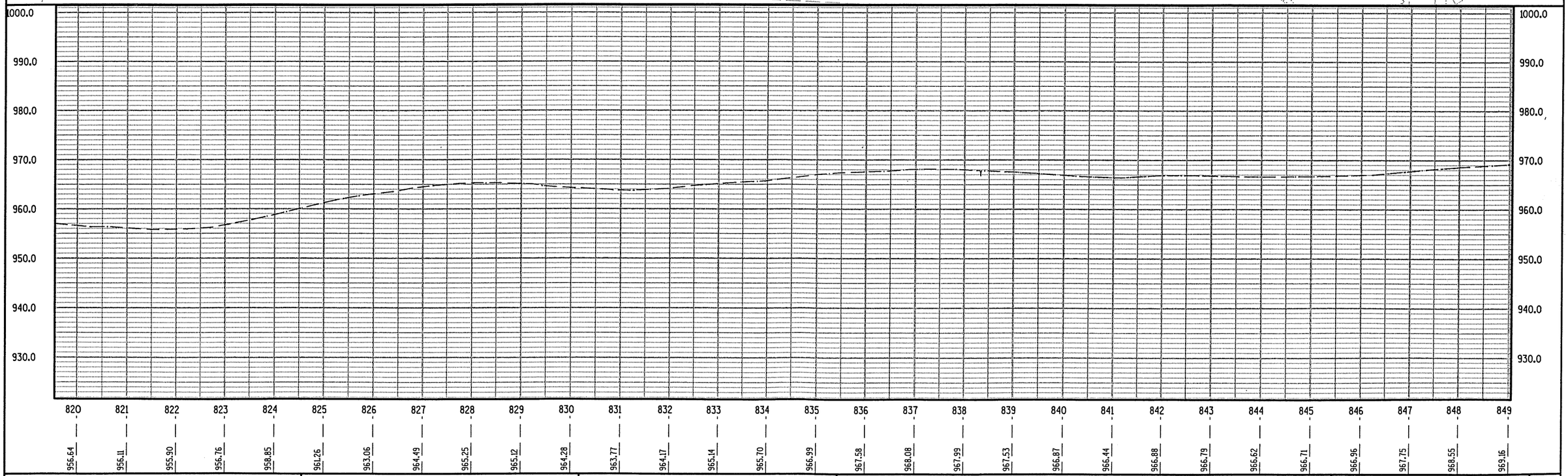

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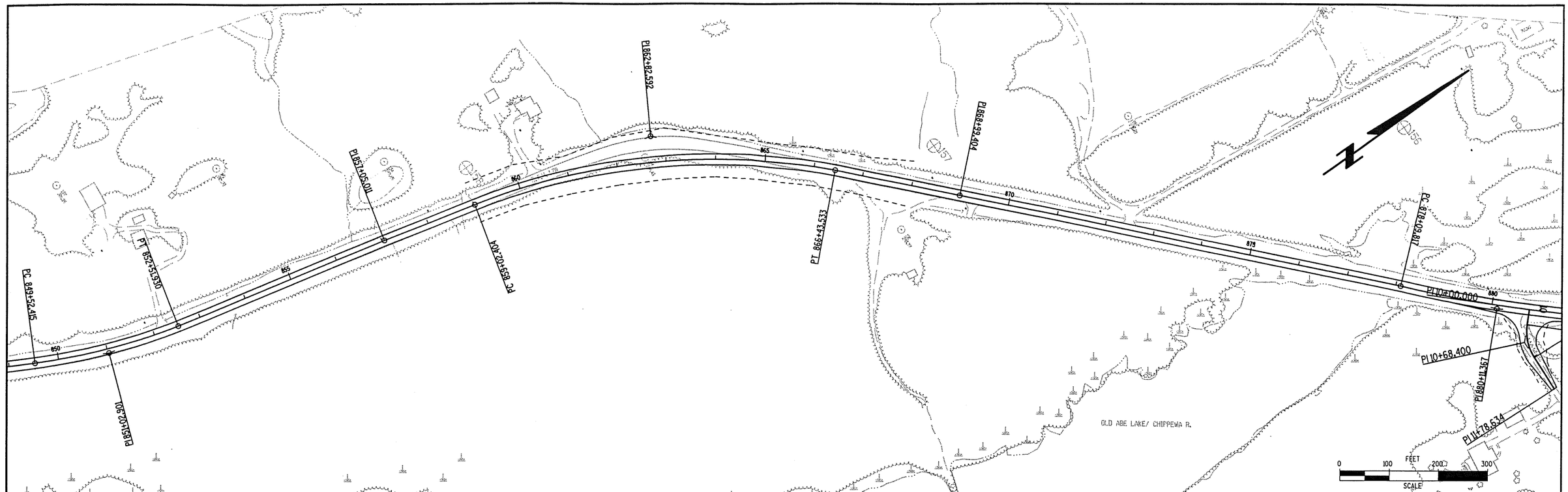

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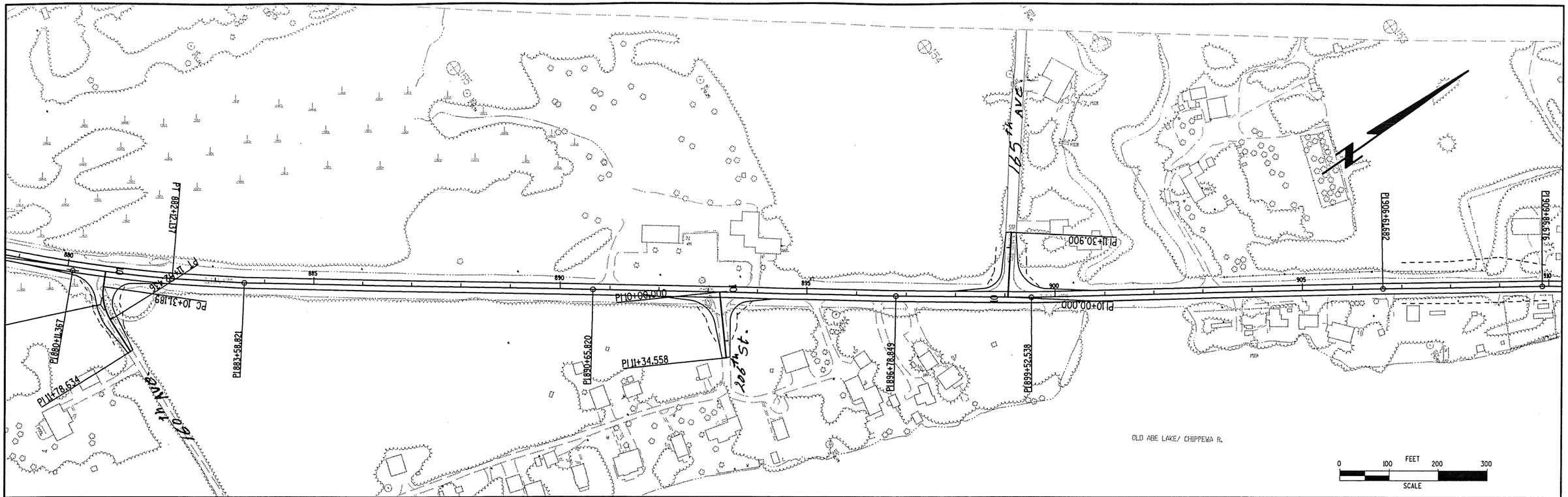

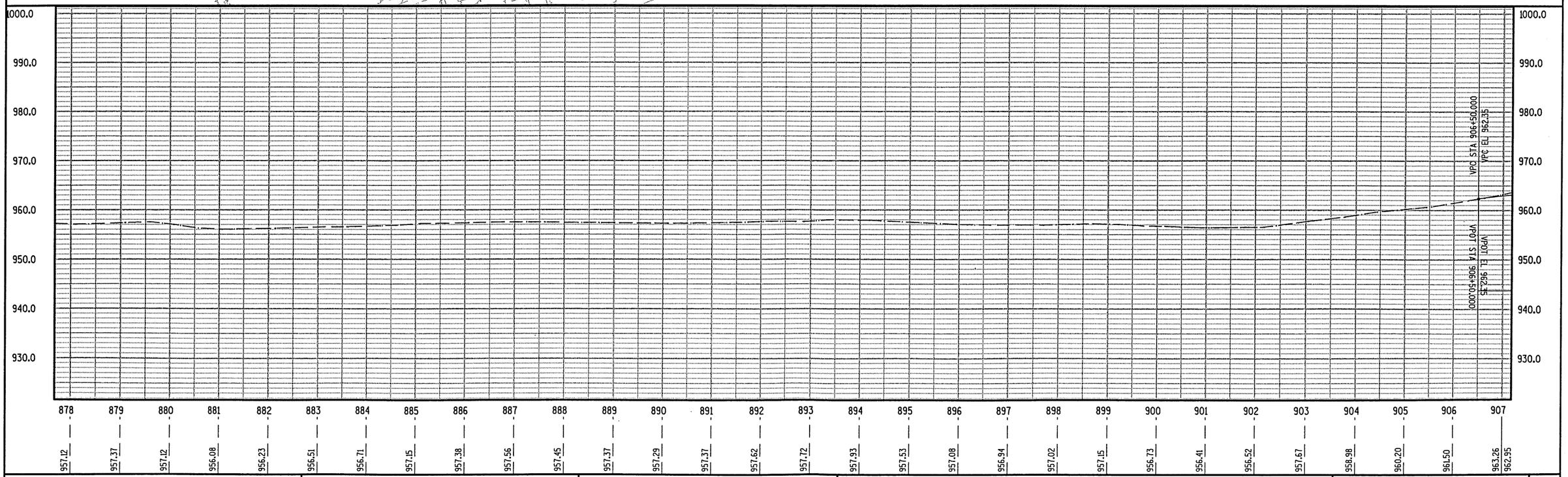

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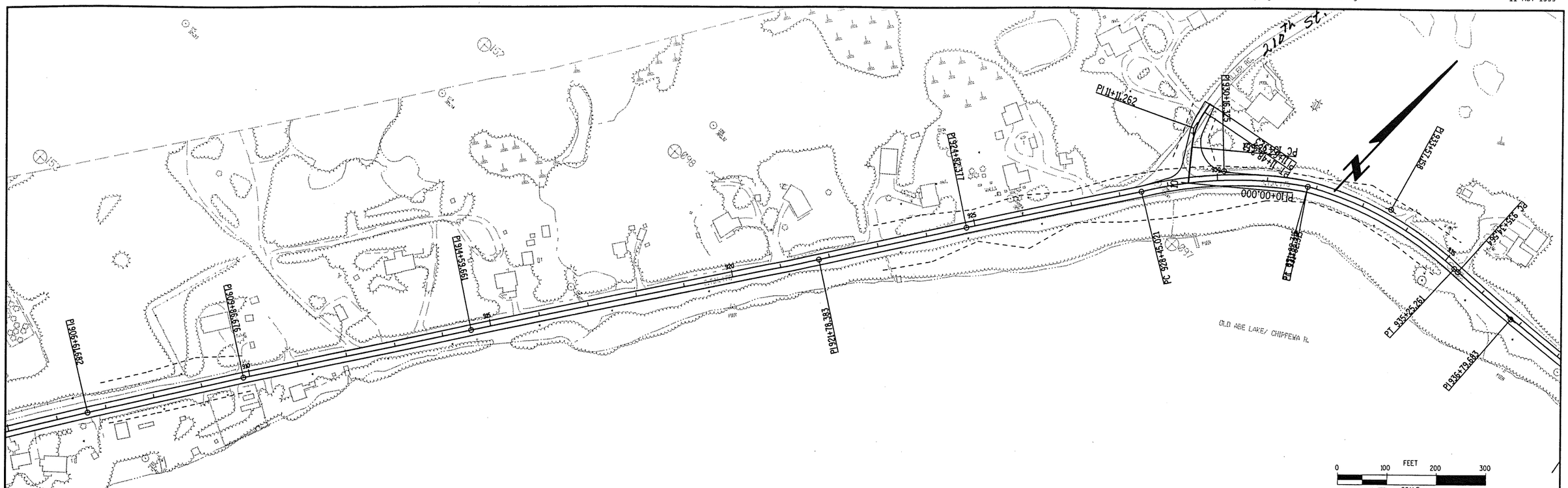

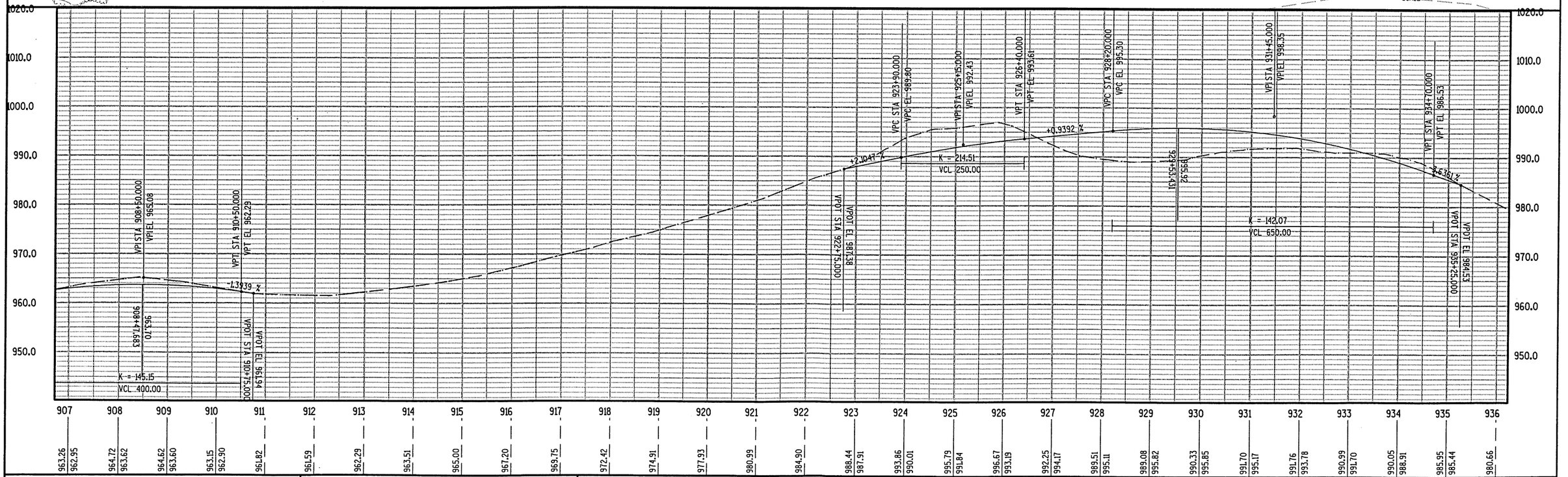

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963.26	964.72	964.62	963.15	961.82	961.59	962.29	963.51	965.00	967.20	969.75	972.42	974.91	977.93	980.99	984.90	988.44	993.86	995.79	996.67	992.25	989.51	989.08	990.33	991.70	991.76	990.99	990.05	985.95	980.66
962.95	963.62	963.60	962.90													987.91	990.01	991.84	993.19	994.17	995.11	995.82	995.85	995.17	993.78	991.70	988.91	985.44	

STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E

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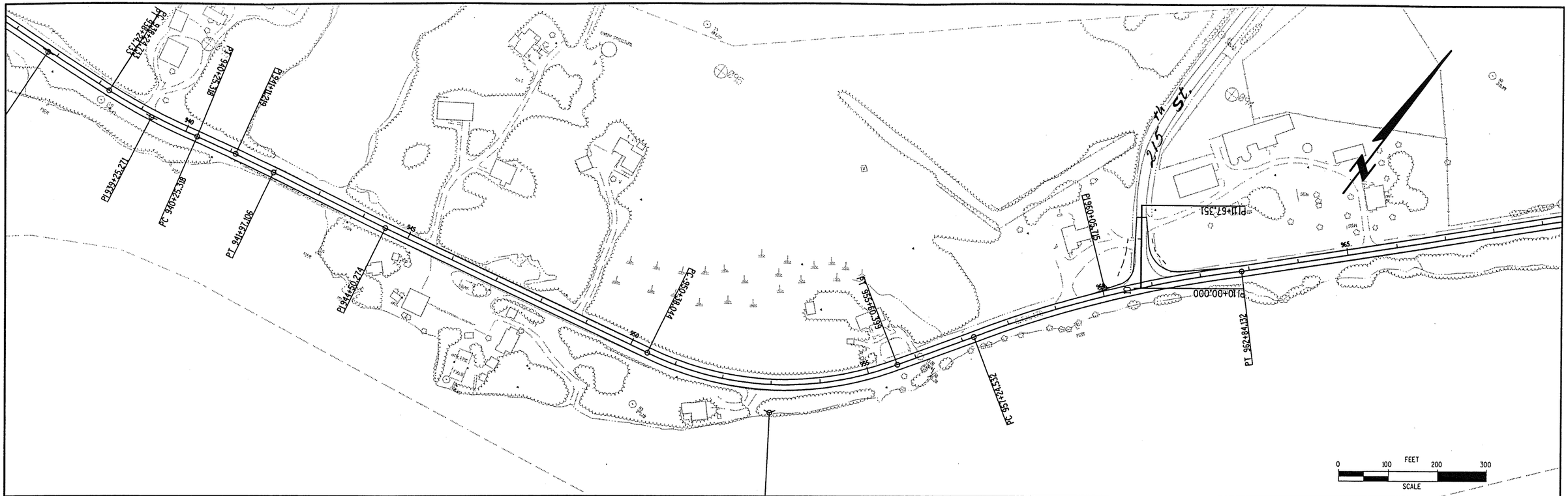

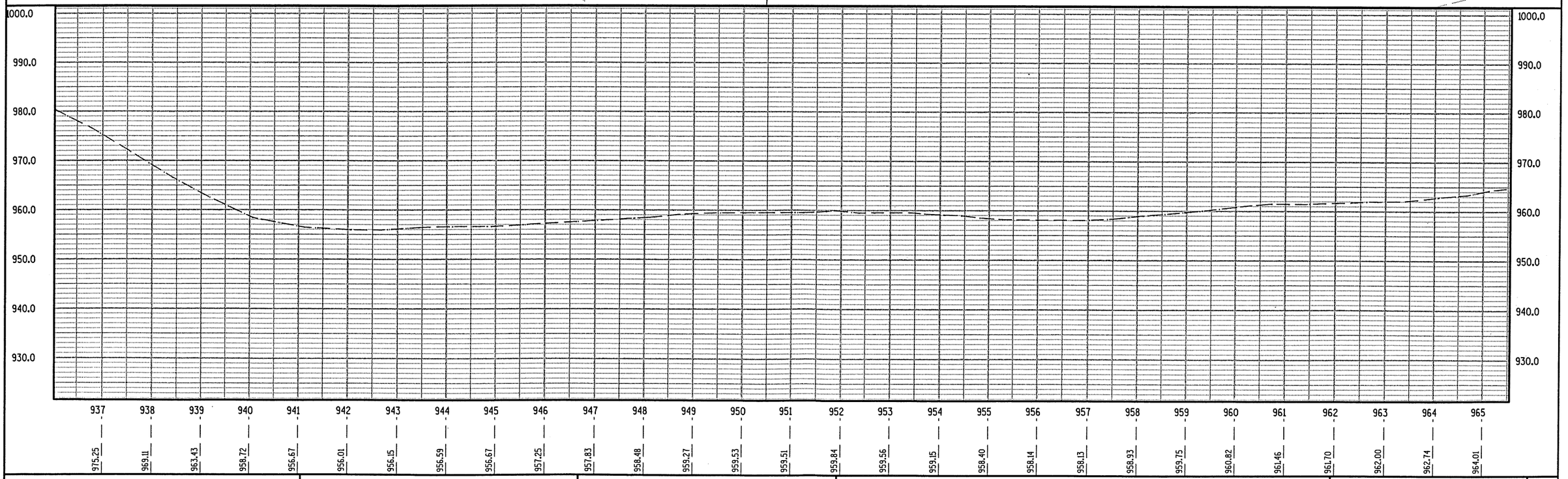

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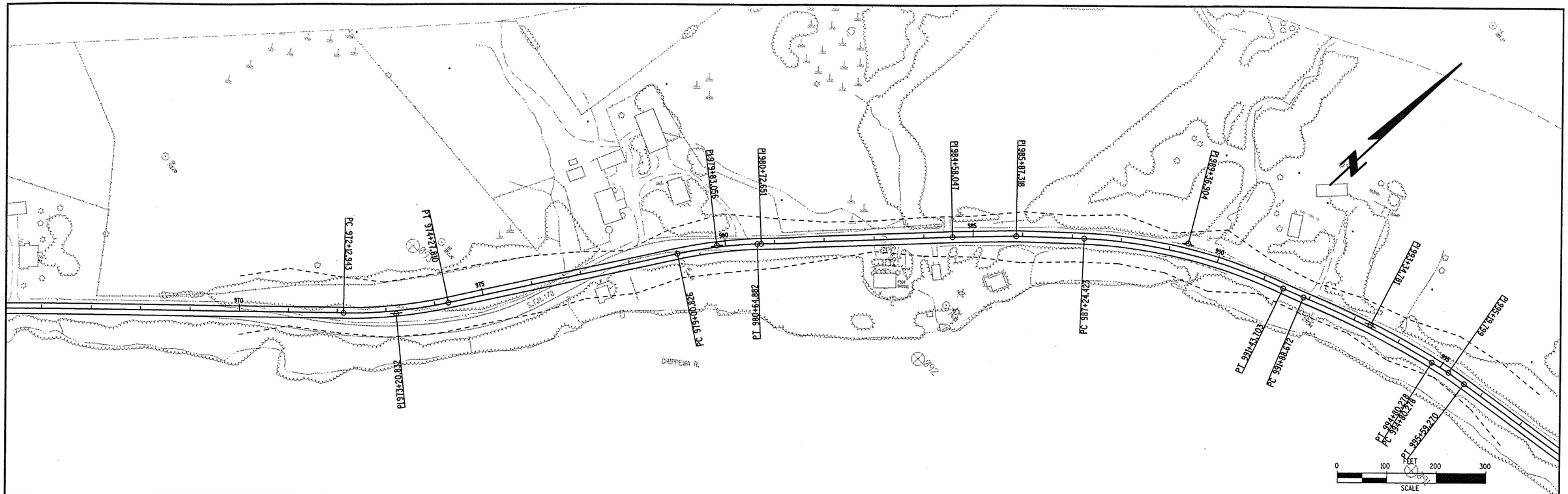

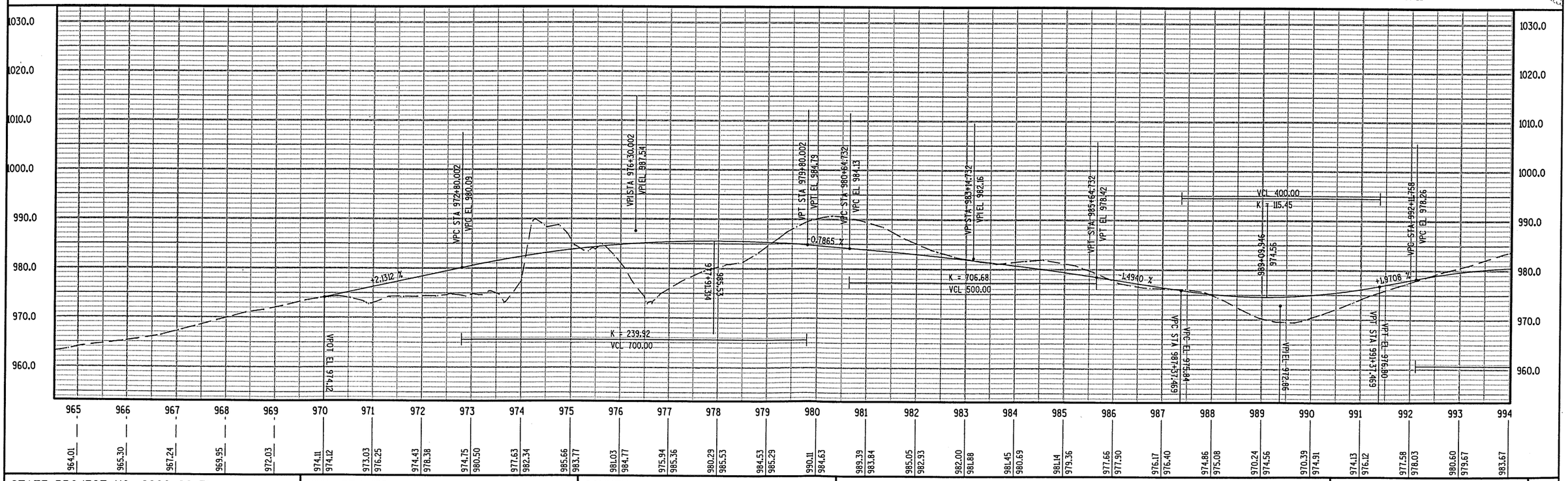

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964.01	965.30	967.24	969.95	972.03	974.11 974.12	973.03 976.25	974.43 978.38	974.75 980.50	977.63 982.34	985.66 983.77	981.03 984.77	975.94 985.36	980.29 985.53	984.53 985.29	990.11 984.63	989.39 983.84	985.05 982.93	982.00 981.88	981.45 980.59	981.14 979.36	977.66 977.90	976.17 976.40	974.86 975.08	970.24 974.56	970.39 974.91	974.13 976.12	977.58 978.03	980.60 979.67	983.67

STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E

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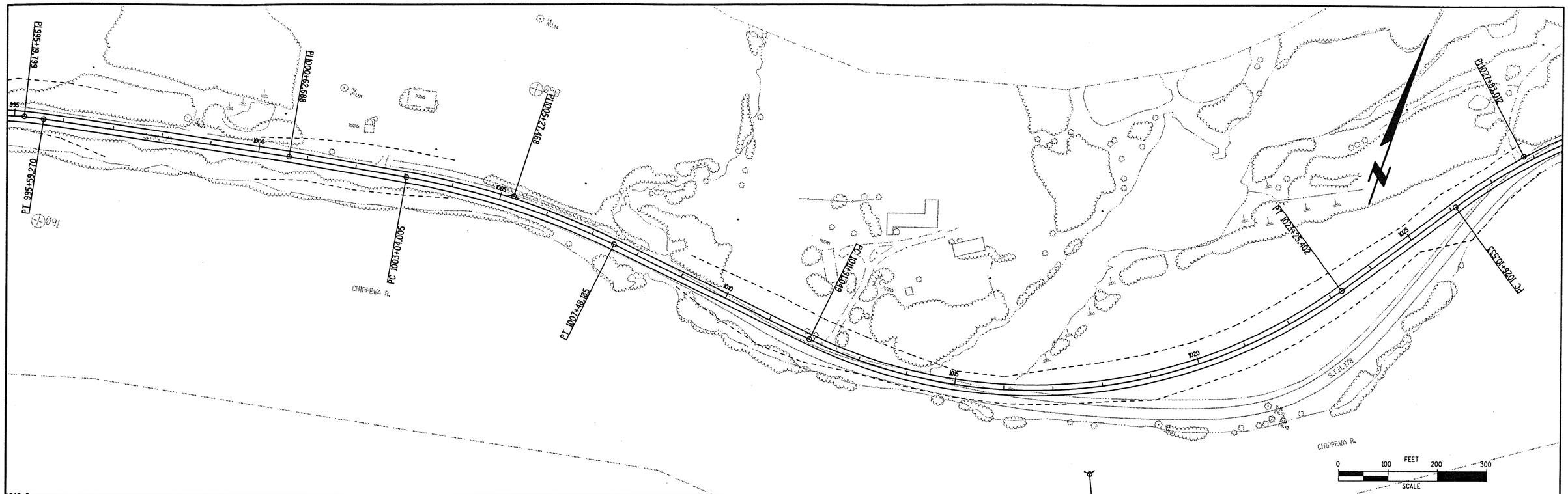

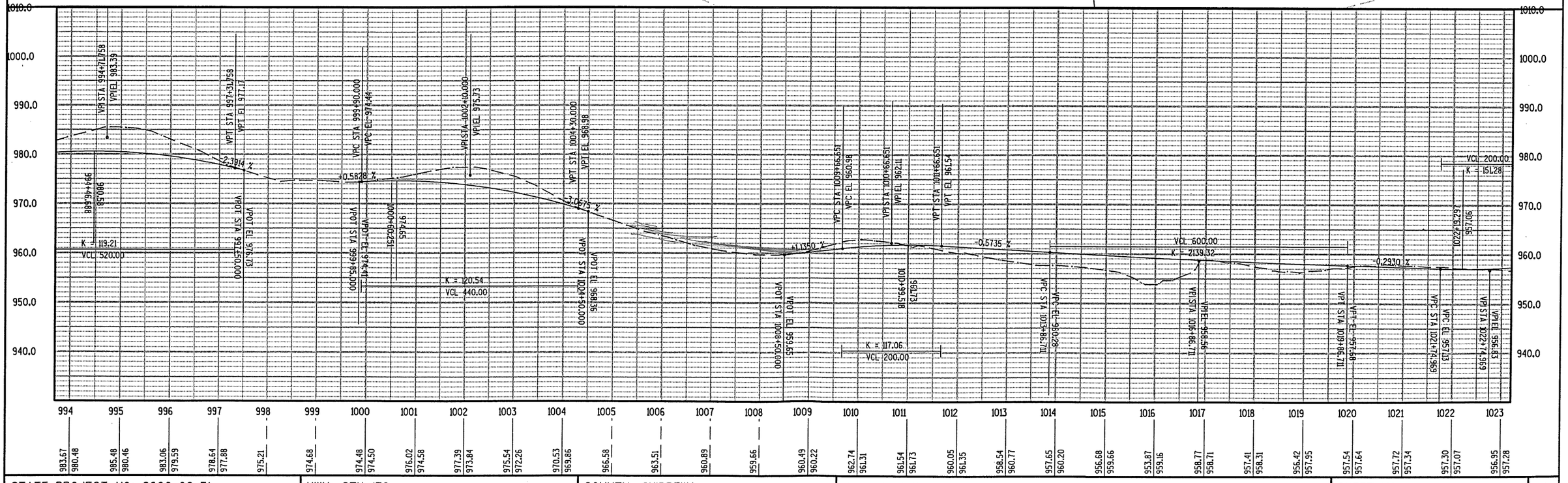

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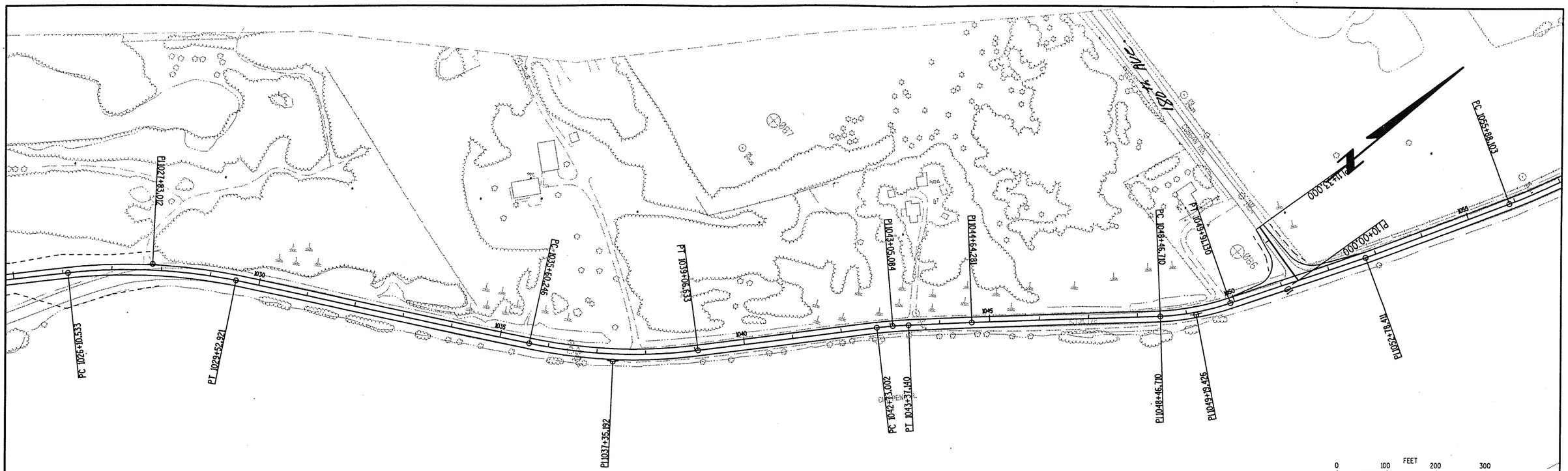

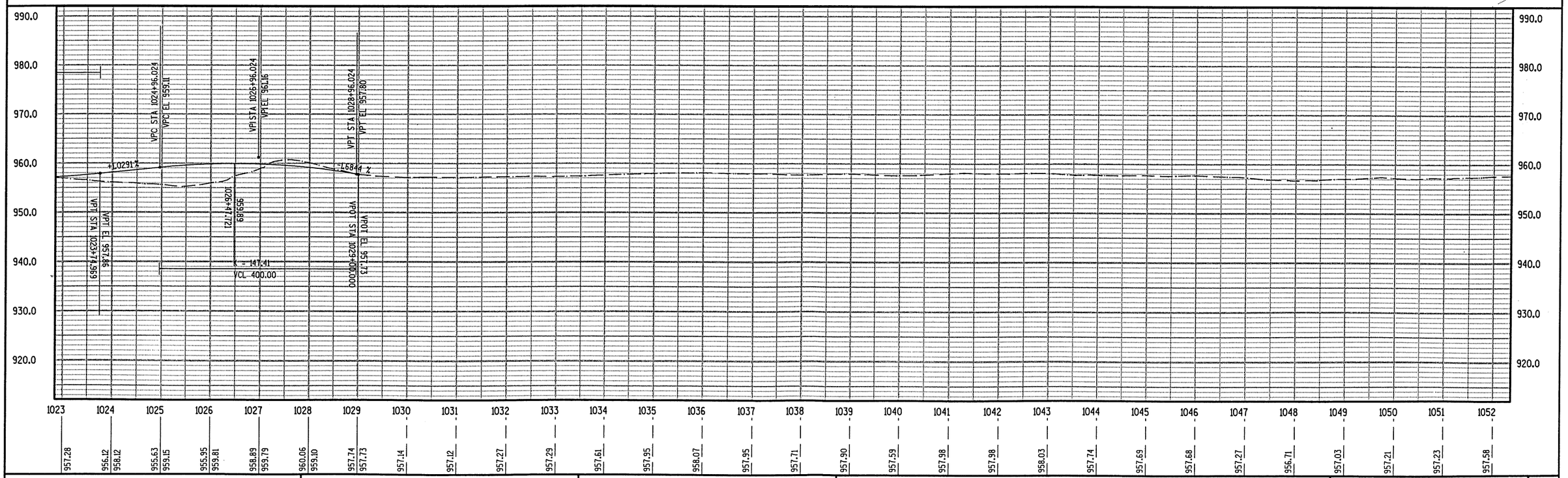

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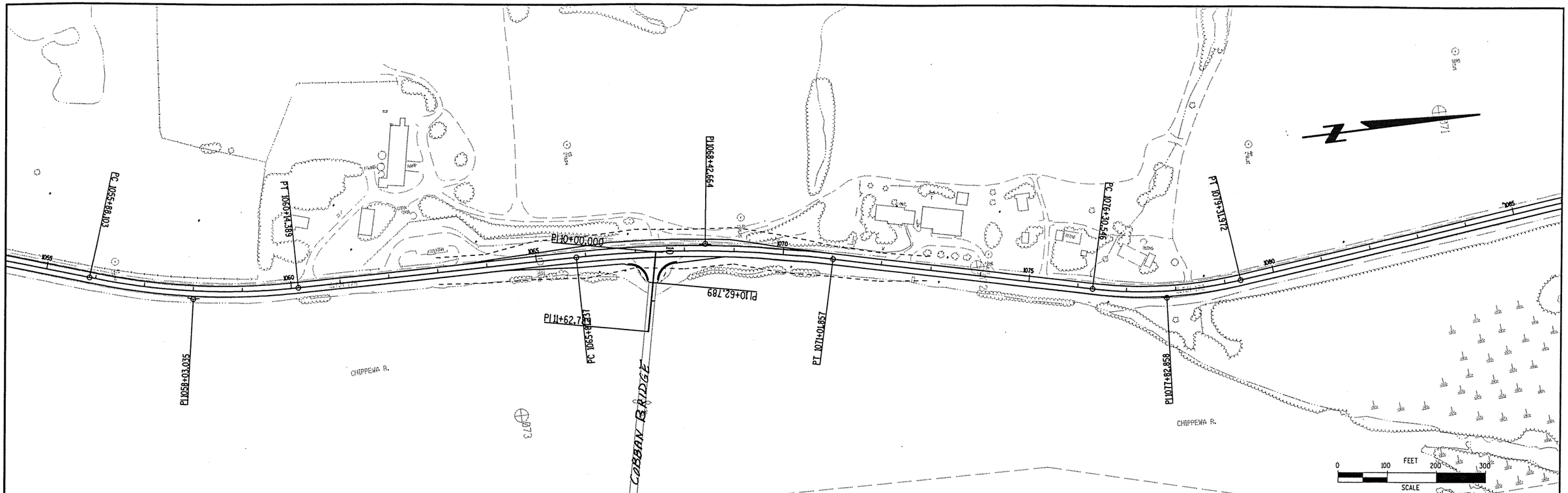

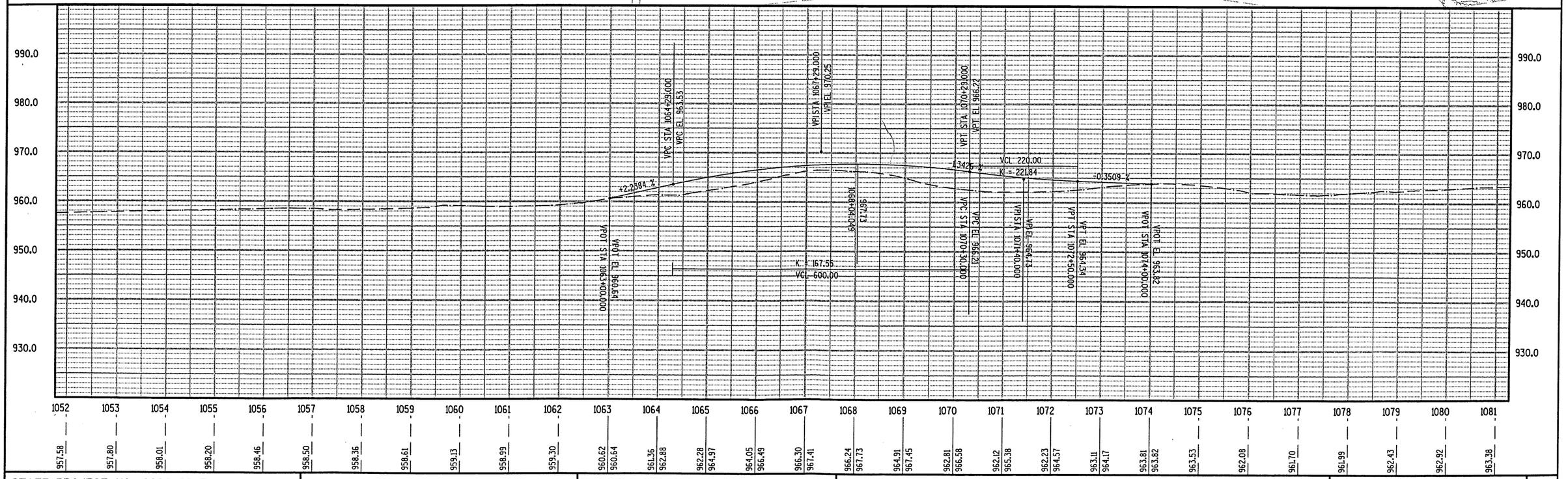

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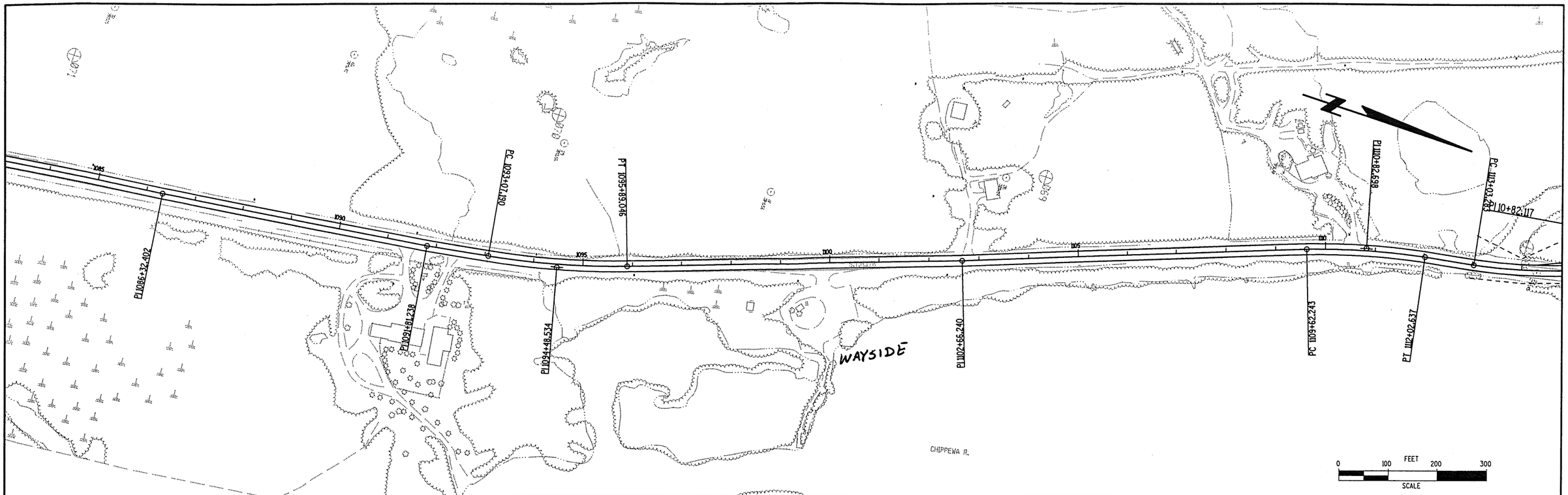

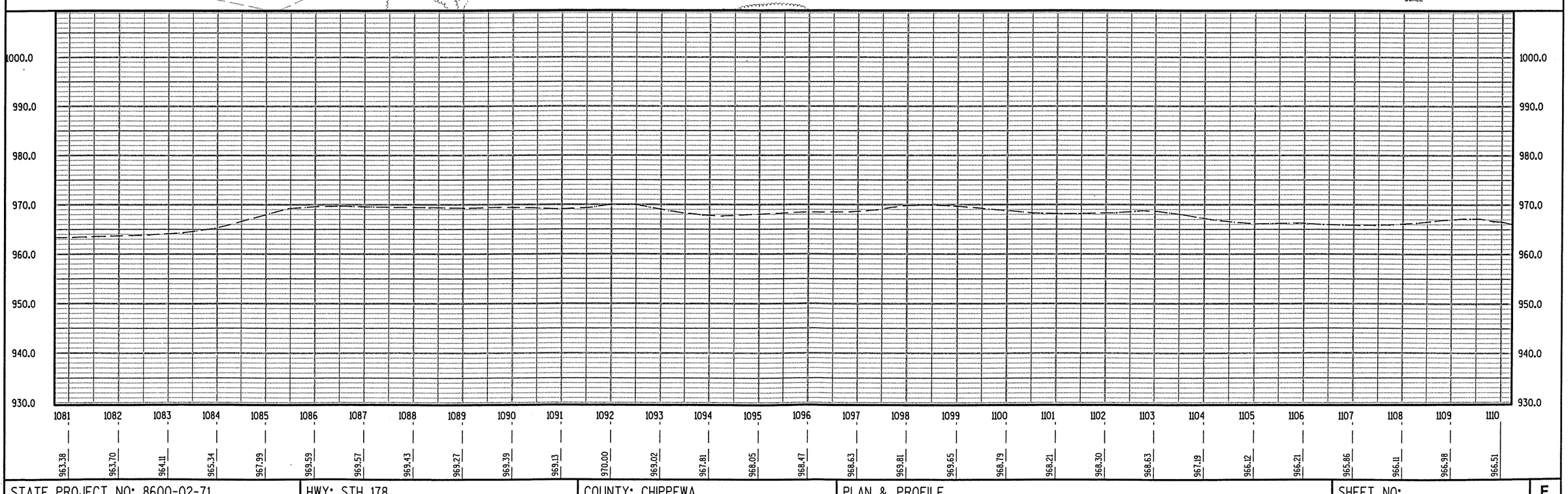

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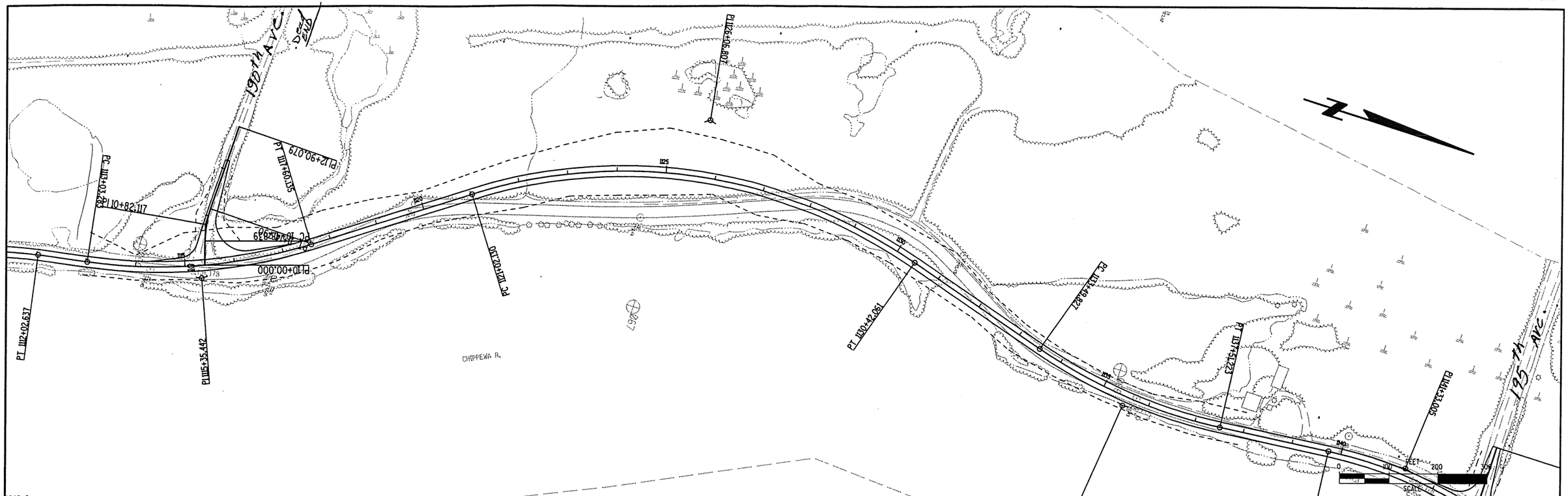

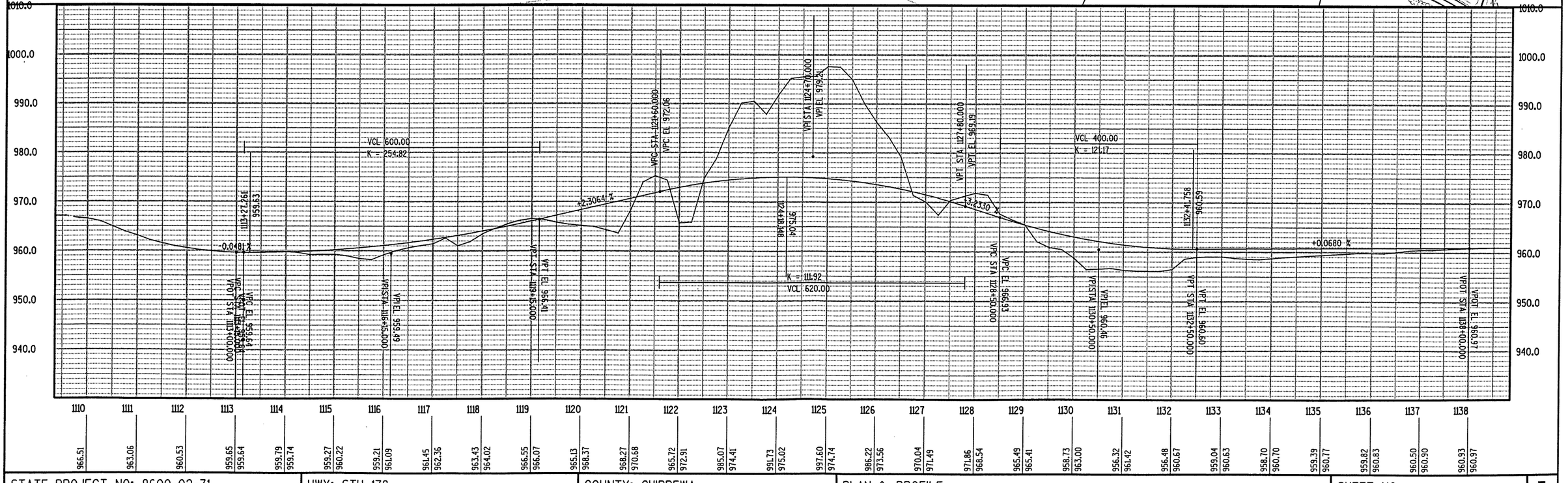

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966.51	963.06	960.53	959.65	959.79	959.27	959.21	961.45	963.43	966.55	965.13	968.27	965.72	985.07	991.73	997.60	986.22	970.04	971.86	965.49	958.73	956.32	956.48	959.04	958.70	959.39	959.82	960.50	960.93
			959.64	959.74	960.22	961.09	962.36	964.02	966.07	968.37	970.68	972.91	974.41	975.02	974.74	973.56	971.49	968.54	965.41	963.00	961.42	960.67	960.63	960.70	960.77	960.83	960.90	960.97

STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E

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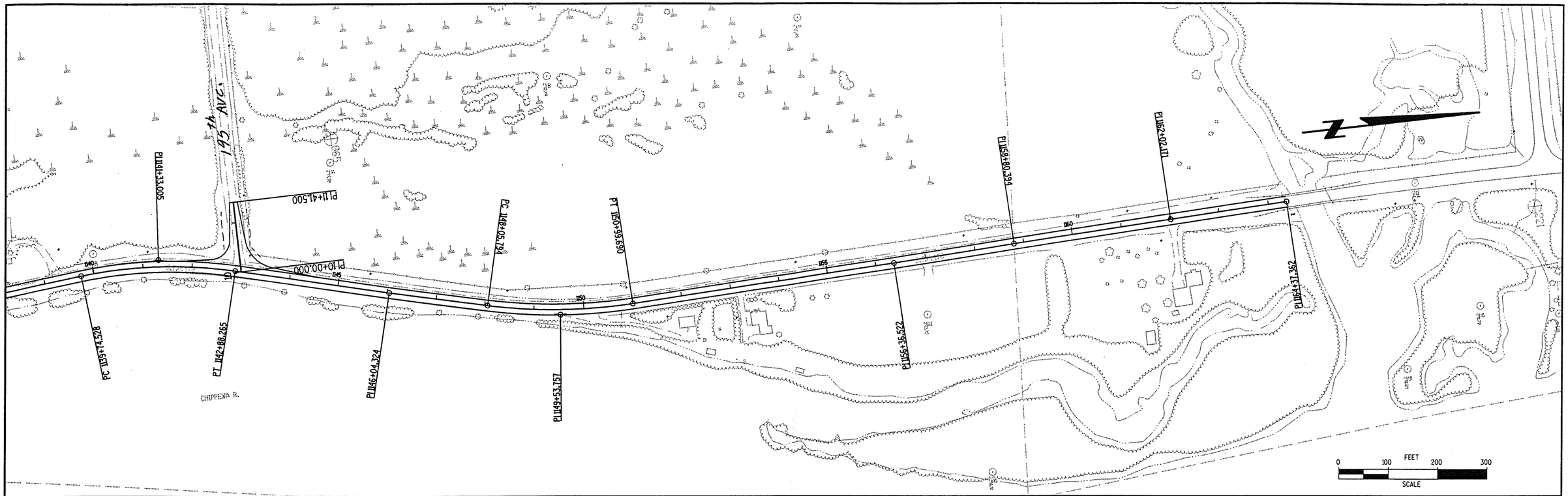

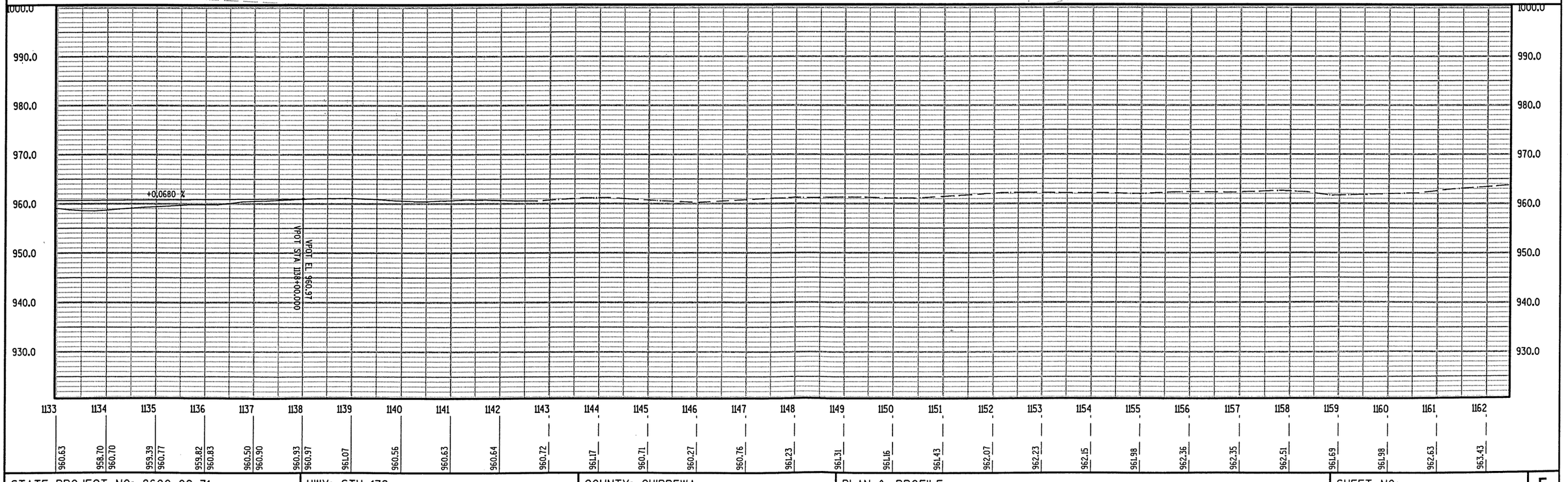

STATE PROJECT NO: 8600-02-71	HWY: STH 178	COUNTY: CHIPPEWA	PLAN & PROFILE	SHEET NO: .	E

Luedtke, Randy

From: Perkins, Mike
Sent: Wednesday, October 11, 2000 1:30 PM
To: Kopacz, Karl
Cc: Luedtke, Randy
Subject: RE: STH 178 - id 8600-02-01, 71 Jim Falls - CTH R -CHIPPEWA CO. Soil Boring Information

I could not find any soils report in the soils/pavement folders. I offer the following for your DSR:

The project soils were formed along outwash plains and stream terraces. Based on Soil Conservation Service mapping, the predominant soils are Menahga and Friendship. These sandy soils comprise over half the project length. Additional soil associations of some note are Chetek, Caryville and Scott Lake which slant more to the sandy loam and loam soils. Soil borings indicate peat, sand, silty sand, sandy silt, and silt along the project route. Noted in the July 16, 1998 Pavement Design Report, the high water table and the silty soils present could present difficulties during construction (especially in areas of realignment/reconstruction). Portions of the project will include marsh and excavation below subgrade.

Karl,
Let me know if you need more than this for the DSR

-----Original Message-----
From: Kopacz, Karl
Sent: Tuesday, October 10, 2000 3:51 PM
To: Perkins, Mike
Subject: STH 178 Soil Boring Information

Mike:

I am in the process of drafting the DSR for STH 178 (Project I.D. 8600-02-01, CTH Y to CTH R, Chippewa County) and am looking for soil information. Previously this project was scoped as a reconstruct (currently is a recondition) and according to notes in the file there were soil borings completed along this section of STH 178. Unfortunately, I cannot find the actual soil and boring information in the file. I was hoping that you would be able to help me out; do you have the original data, copies, etc. of soil information for this project? Or can you direct me to where I might be able to find it? I would appreciate your help. Thanks.....Karl Kopacz, 833-5566

as per Soils Investigation Report

Jan 3/2002

shift of 5'

grid Breaker

- EBS prior to Grid & Breaker Run

Correspondence

CORRESPONDENCE/MEMORANDUM
DISTRICT #6

State of Wisconsin
Department of Transportation

Date: December 29, 1999

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: **PAVEMENT DESIGN DOCUMENTATION-REVISED**
Approval Letter

Project 8600-02-01
Chippewa Falls - Cornell
Jim Falls - CTH R
STH 178
Chippewa County

Upon review of the attached pavement design documentation, the pavement type selection recommendations are approved for the above mentioned project segments. The Project Engineer should forward a copy of this document to the appropriate C.O. representative at this time or attach it as documentation to the revised Design Study Report(DSR).

NOTE: The Exact stationing of the following typicals will be defined with a final field review to completed in 2000-2001.

Reviewed:

COMMENTS

Rick Shermo 12/29/99
Richard J. Shermo, PE Date
District #6 Area Supv.-Project Development Section

Approved:

COMMENTS

Michael Ostrowski 1/3/00
Michael S. Ostrowski, P.E. Date
District #6 Manager-Project Development Section

RJS 12/29
MSO 1/3/00
MMH 1-4-00
last RWL
FILE

CORRESPONDENCE/MEMORANDUM
DISTRICT #6

State of Wisconsin
Department of Transportation

Date: December 29, 1999

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: **PAVEMENT DESIGN DOCUMENTATION-REVISED**
Approval Letter

Project 8600-02-01
Chippewa Falls - Cornell
Jim Falls - CTH R
STH 178
Chippewa County

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COMMENTS

12/29/99
Richard J. Shermo, PE — Date
District #6 Area Supv.-Project Development Section

Approved:

COMMENTS

1/3/00
Michael S. Ostrowski, P.E. — Date
District #6 Manager-Project Development Section

RJS 12/29
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Jim Falls - CTH R
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COMMENTS

Richard J. Shermo, PE — Date 12/29/99
District #6 Area Supv.-Project Development Section

Approved:

COMMENTS

Michael S. Ostrowski, P.E. — Date 1/3/00
District #6 Manager-Project Development Section

RJS 12/29
MSO 1/3/00
MMH 1-4-00
last RWL
FILE

Luedtke, Randy

From: Hayek, Mohamad
Sent: Tuesday, September 14, 1999 11:24 AM
To: Anderson, Paul; Effinger, Robert; Bisonette, Dale; Drake, Raymond; Helgeson, Greg; Kern, Jeffrey; Shermo, Richard; Hyland, Lary; Ostrowski, Mike; Luedtke, Randy; Pawelski, Timothy; Hayek, Mohamad
Subject: Agenda For STH 178 Design Review Meeting on THurs. Sep. 16,1999

1. Design Constraints / Criteria / Commitments

    -Typical
    -Clear zone
    -Design Speed
    -Exception to Standards

2. Review of Horizontal & Vertical Alignments

    -DNR Concerns
    -Critical locations
    -Intersections
    -By - Pass left turn lanes
    -Vision Triangles
    -Misc. Items (Cobban Bridge , etc.)

3. Construction Staging

    -Filing over old ditch lines (for slight alignment shifts)
    -Special slopes (rip rap).
    -Misc. items.

4. Structures

    -Retaining Walls
    -Culverts

5. Drainage

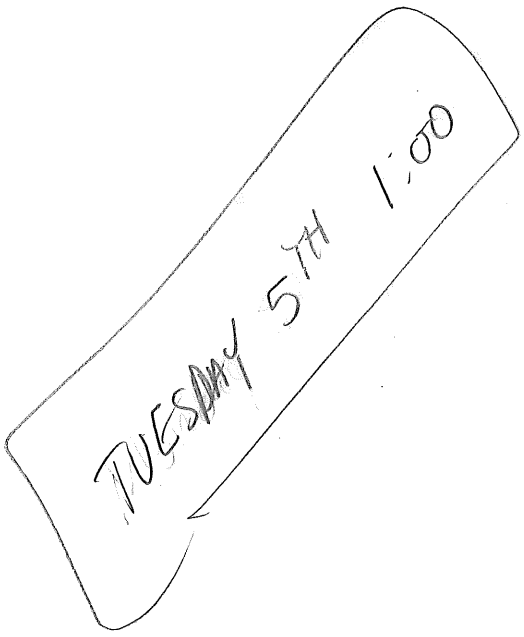
    -Curb & Gutter Locations
    -Culverts

6. R / W

    -Reduce Access / Driveways
    -6F (Wayside)
    -Misc. items

7. Misc.

    -Schedule
    -Cost Estimate
    -DNR coordination / concerns
    -Archeology
    -Environmental concern / update



4/11/00

STH 178

Mill & Overlay:
789+51 to 859+00
(Beamguard 811+00 to 814+00 Right)

Align Correction:
859+00 to 868+00

Mill & Overlay:
868+00 to 906+50

Profile Correction:
906+50 to 910+75

Mill & Overlay:
910+75 to 922+75

Profile Correction:
922+75 to 935+25
(Beamguard 929+00 to 932+00 Right)

Mill & Overlay:
935+25 to 938+50

Profile Correction:
938+50 to 946+00
(Beamguard 940+50 to 944+00 Right & Left)

Mill & Overlay
946+00 to 970+00
(Beamguard 957+00 to 96+00 Right)

Align Correction
970+00 to 980+25
(Beamguard 970+00 to 978+00 Right) ?

Profile Correction
980+25 to 997+50

Mill & Overlay
997+50 to 999+85

Profile Correction
999+85 to 1004+50

Mill & Overlay
1004+50 to 1008+50

Align Correction
1008+50 to 1029+00
(Beamguard 1012+50 to 1016 Right)

Mill & Overlay
1029+00 to 1063+00
(Beamguard 1030+00 to 1063+00 Right)

Profile Correction
1063+00 to 1074+00 (Beamguard 1063+00 to 1076+00 Right)

Mill & Overlay
1074+00 to 1113+00

Align Correction
1113+00 to 1141+00
(Beamguard 1113+00 to 1116+00, 1118+50 to 1121+00 Right)
(Beamguard 1127+50 to 1136+00 Right)

Mill & Overlay
1141+00 to 1164+21
(Beamguard 1141+00 to 1144+50, 1147+00 to 1149+00 Right)

CORRESPONDENCE/MEMORANDUM
DISTRICT #6

State of Wisconsin
Department of Transportation

Date: December 29, 1999

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: **PAVEMENT DESIGN DOCUMENTATION-REVISED**
Approval Letter

Project 8600-02-01
Chippewa Falls - Cornell
Jim Falls - CTH R
STH 178
Chippewa County

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Reviewed: COMMENTS

Richard J. Shermo, PE Date
District #6 Area Supv.-Project Development Section

Approved: COMMENTS

Michael S. Ostrowski, P.E. Date
District #6 Manager-Project Development Section

RJS_____
MSO_____
MMH_____
last RWL_____
FILE_____

CORRESPONDENCE/MEMORANDUM State of Wisconsin
DISTRICT#6 Department of Transportation

Date: December 29, 1999

To: File

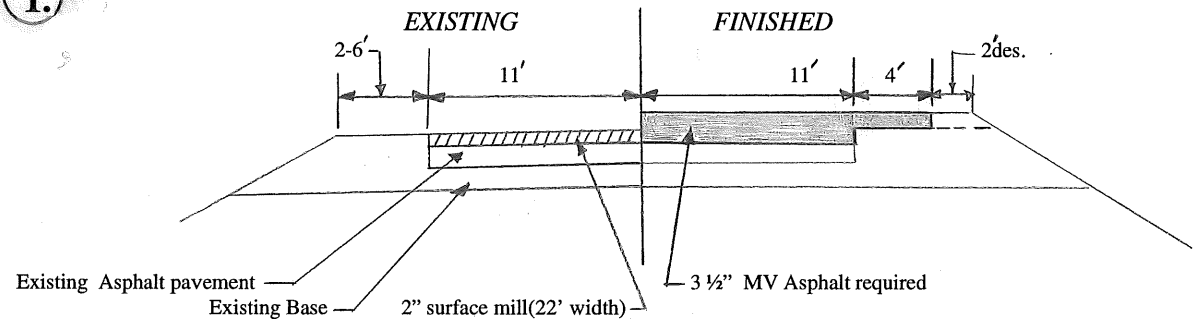
From: Randy W. Luedtke, P.E.
District Pavement Design Engineer

Subject: Pavement Documentation -*REVISED*
Project ID 8600-02-01
Chippewa Falls - Cornell
Jim Falls - CTH R
STH 178
Chippewa County

On this project, the Pavement Design Report for reconstruction was approved in October of 1998 as a 5" asphalt over 11" of Base over 11" of sand lift. In the fall of 1999, the project was re-visited to redefine the scope of the project. Since the roadway is classified as a collector and not an arterial highway, it was concluded that the District's 33 program could not handle a full reconstruct option. In-house and field review has led to the following alternatives being chosen as the best solution to fit under the initial cost constraints. The LCCA was not re-done because all of the additional alternatives drawn below have less initial cost than the reconstruct typical.

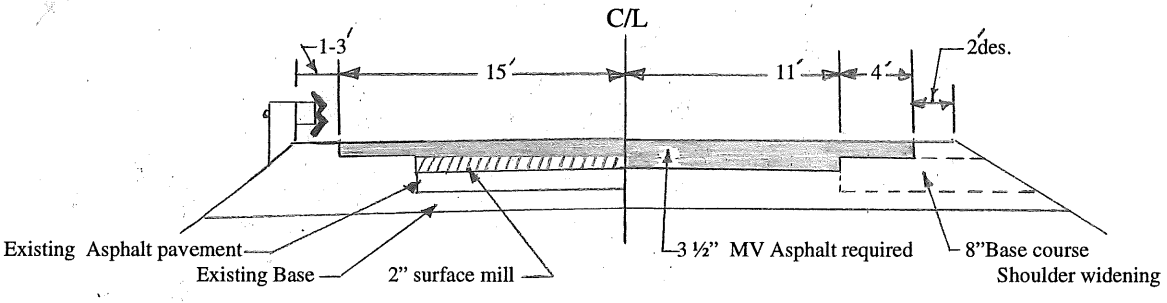
TYPICALS

1. RESURFACE
STH 178
C/L



A provision should be included that the lower lift asphalt paving operation shall start within 10 calendar days of any area that has been surface milled. Shoulder shall be shaped prior to paving to allow for a 1 ½"lower layer and 2"surface layer

2. BEAM GUARD/WIDENING ½ ROADWAY
STH 178
C/L



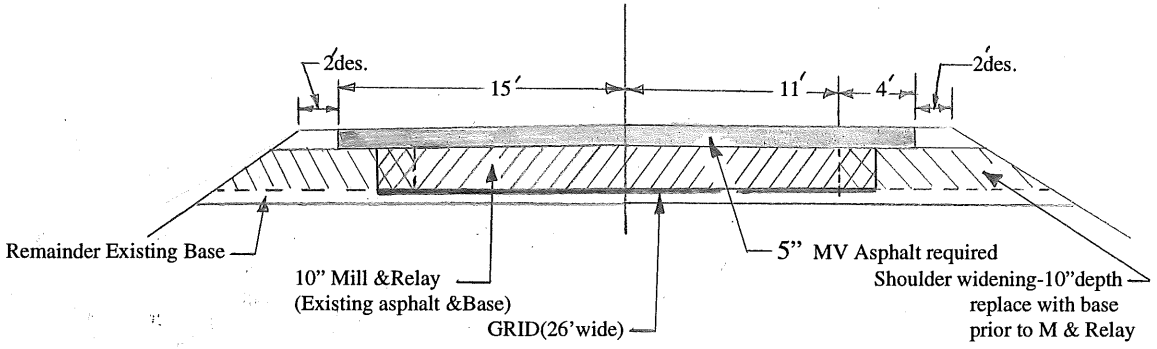
TYPICALS -CONT.

3.

RESURFACE/MILL &RELAY-GRID FULL WIDTH

STH 178

C/L

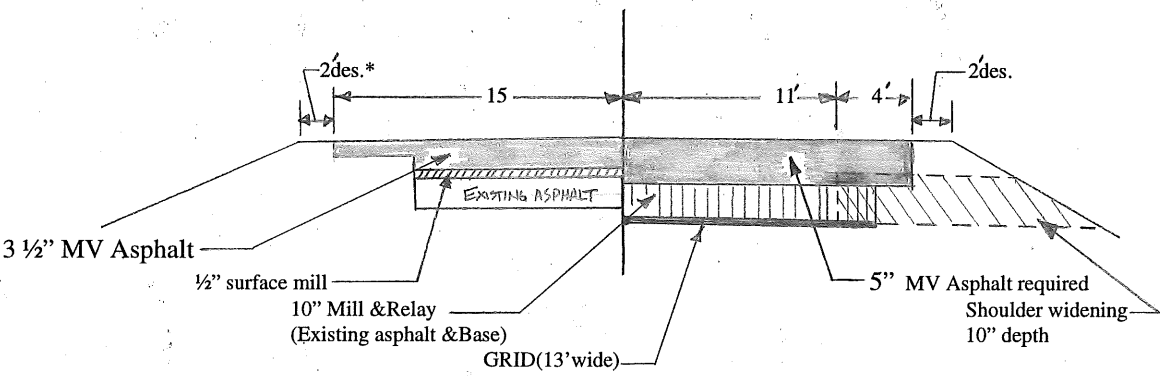


4.

RESURFACE/MILL &RELAY-GRID ½ Roadway

STH 178

C/L



***1-3' if beam guard area**

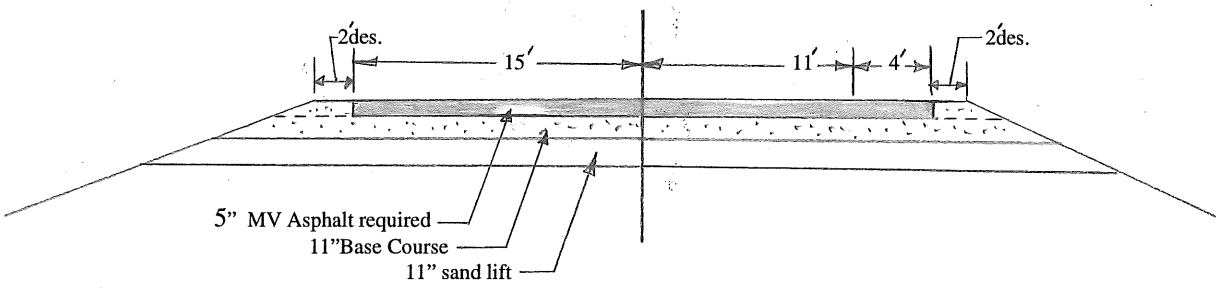
In areas where the grid is only needed on ½ of the roadway, there will need to be some staging specified on the plan. An example is as follows: 1. Notch shoulder at existing edge to a depth of 10" and push outward to widen shoulder. 2. Mill out and/or remove existing ½ roadway core to a depth of 10" and stockpile material(if no local traffic -stockpile on adjacent lane). 3. Place grid 4. Relay/Spread salvaged road core material over grid and widened shoulder area. 5. Add additional base course to provide a minimum of 8" lift material over the grid area. 6. Place 1 ½" Asphalt to match adjacent surface milled profile. *This example will/may need to be modified to match final plan conditions.*

There should also be a provision that no trucking or other heavy construction traffic be allowed in grid area until at lest the lower levels of asphalt(3") are placed.

5.

RECONSTRUCT-(same as original PDR)

STH 178

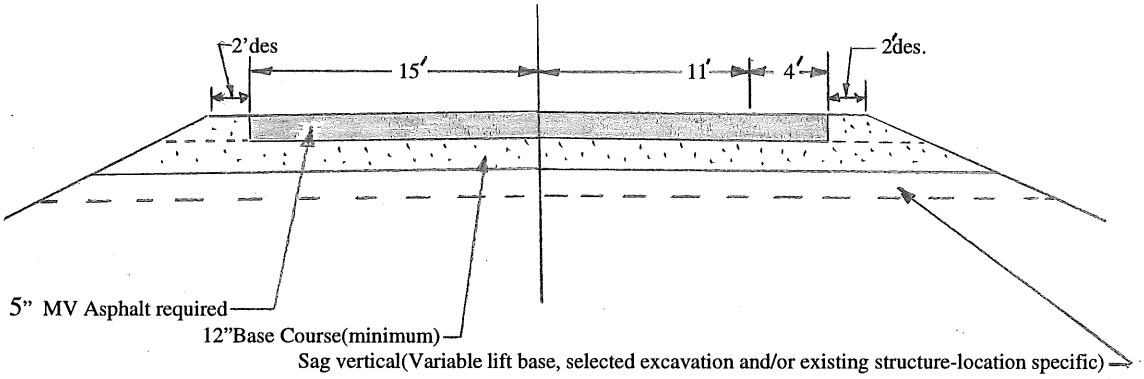


Sand lift material should be specified as Grade #2

TYPICALS -CONT.

6.

VERTICAL PROFILE ADJUSTMENT
STH 178
C/L



Transition details will be required when switching from typical to typical. Length of transition will be dependent upon location.

The Lane line should be placed at 11' on all typical sections and is very important that it be placed there for stability and support in the typical sections 1-4.

Lane and shoulder widths may be modified to match appropriate 3R standards.

Randy W. Luedtke, PE

CORRESPONDENCE/MEMORANDUM
DISTRICT #6

State of Wisconsin
Department of Transportation

Date: December 29, 1999

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: **PAVEMENT DESIGN DOCUMENTATION-REVISED**
Approval Letter

Project 8600-02-01
Chippewa Falls - Cornell
Jim Falls - CTH R
STH 178
Chippewa County

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Reviewed: COMMENTS

Richard J. Shermo, PE Date
District #6 Area Supv.-Project Development Section

Approved: COMMENTS

Michael S. Ostrowski, P.E. Date
District #6 Manager-Project Development Section

RJS_____
MSO_____
MMH_____
last RWL_____
FILE_____

CORRESPONDENCE/MEMORANDUM

DISTRICT#6

State of Wisconsin
Department of Transportation

Date: December 29, 1999

To: File

From: Randy W. Luedtke, P.E.
District Pavement Design Engineer

Subject: Pavement Documentation -*REVISED*
Project ID 8600-02-01
Chippewa Falls - Cornell
Jim Falls - CTH R
STH 178
Chippewa County

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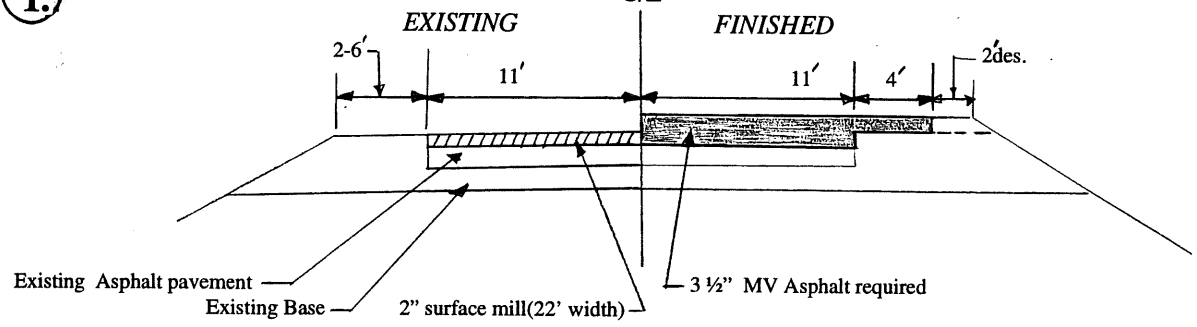
C/L



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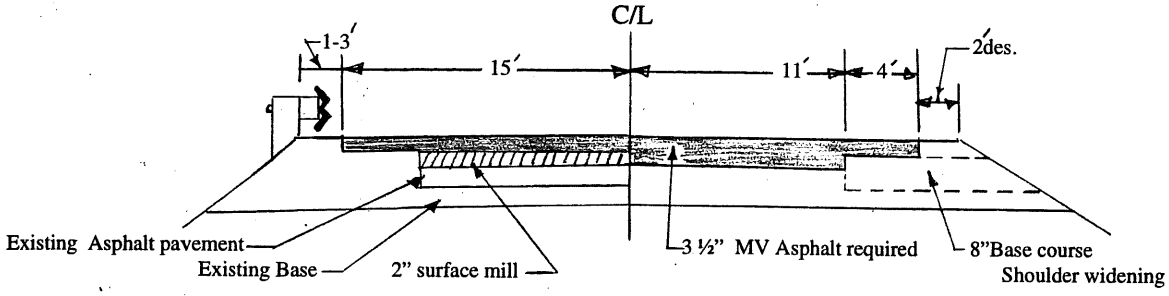
STH 178
C/L



TYPICALS -CONT.

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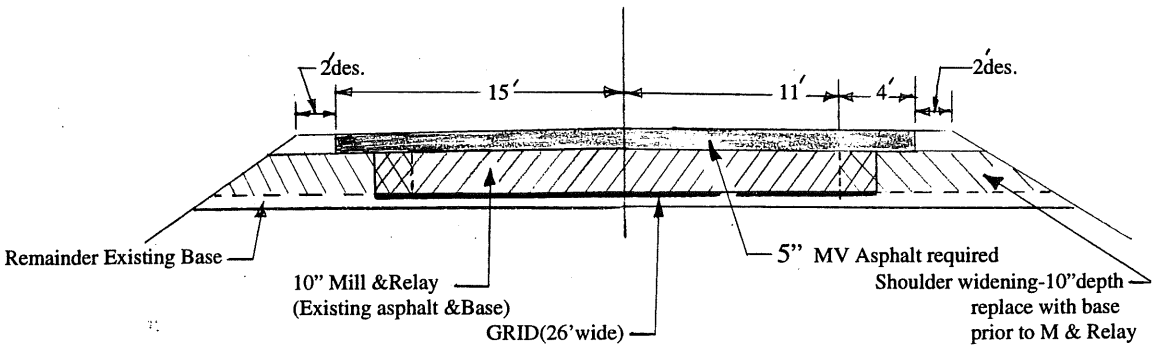
STH 178

C/L



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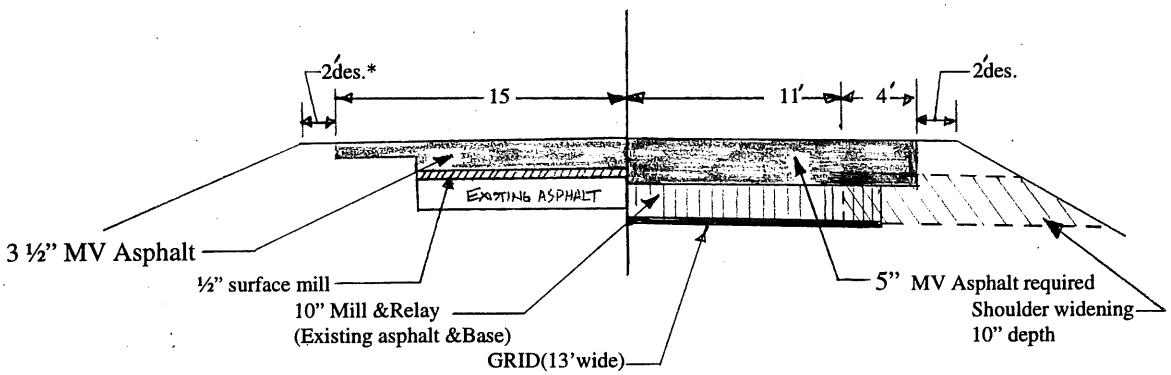
STH 178

C/L



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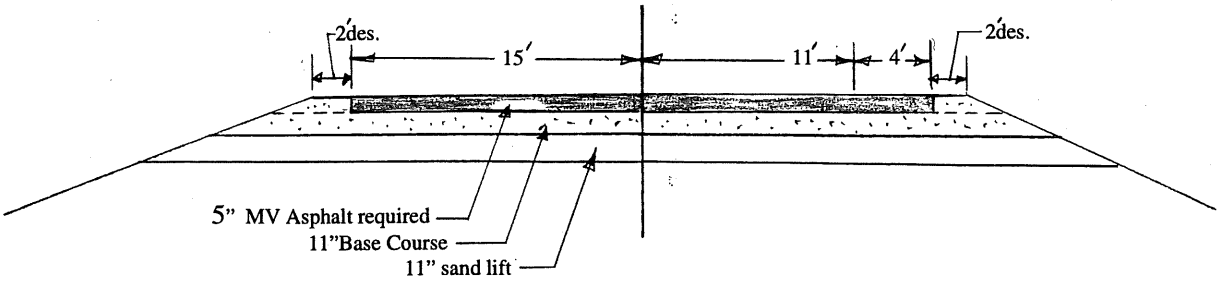
STH 178



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TYPICALS -CONT.

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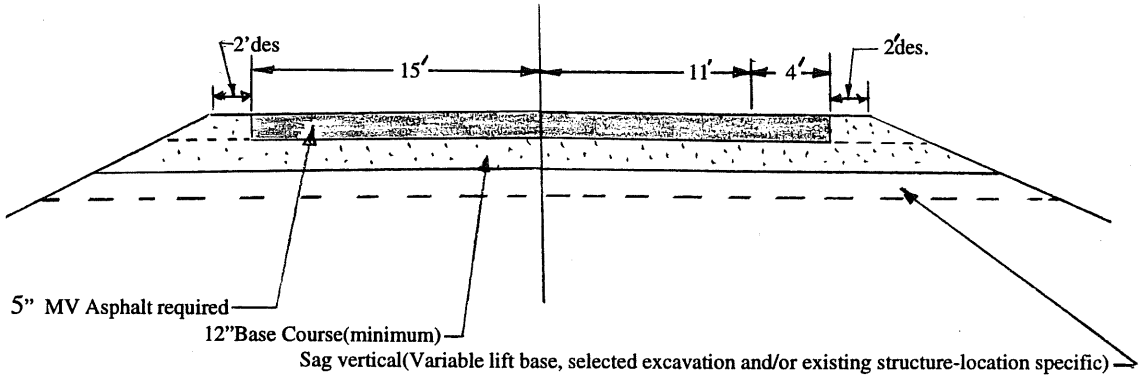
VERTICAL PROFILE ADJUSTMENT

STH 178

C/L



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Randy W. Luedtke, PE

CONCEPT DEFINITION REPORT

Date: 07/17/96 To: Michael A. Cass (P.E.) From: District 6

I. Design ID: 8600-02-01 Related ID(s): 8600-02-71(Const)
Highway No. or Local Road Name: STH 178 8600-02-21 (R/W)
Title: CHIPPEWA FALLS - CORNELL ROAD
County: CHIPPEWA Length: 7.4 Miles 11.9 km
Functional Class: Major Collector Current ADT: 1650 (1993)
LOCATION: CTH Y - CTH R

II. A. Roadway Conditions:
Pavement: Type: AC Width: 22 Year: 1981
PSI: 2.69 (1993) PDI: 30 (1994)
Shoulder: Type: Gravel Width: 2
Accident Rate: 480 Year: 1995
Substandard Alignment: Horizontal: Yes Vertical: Yes

B. Structure: (may be continued on back side)
Type: DECK GIRDER Length: 86.5 ft, 26.4 m
Bridge Number: B-09-0682 Year Constructed: 1942
Clear Roadway Width: 27.6 SR: 80.5 RS: 89.4

JUSTIFICATION: Accident rate is 480 vs State ave of 222 because of narrow shoulders, sharp horiz curvature and short vertical and horiz sight distance. There are many power poles and trees in clear zone.

III. PROPOSED IMPROVEMENT: Grade, Base, Asphaltic Surface to C3 standards with a 24 ft surface on a 36 ft roadway with a 30 ft clear zone.

A. Environmental documentation type: III ER
B. Improvement Type: RECST PMSID: 98060020201
C. Cost: $ 3,850,000 Program Year: 2002 Program: 3334
D. Local Participation: $ No Access Control: No

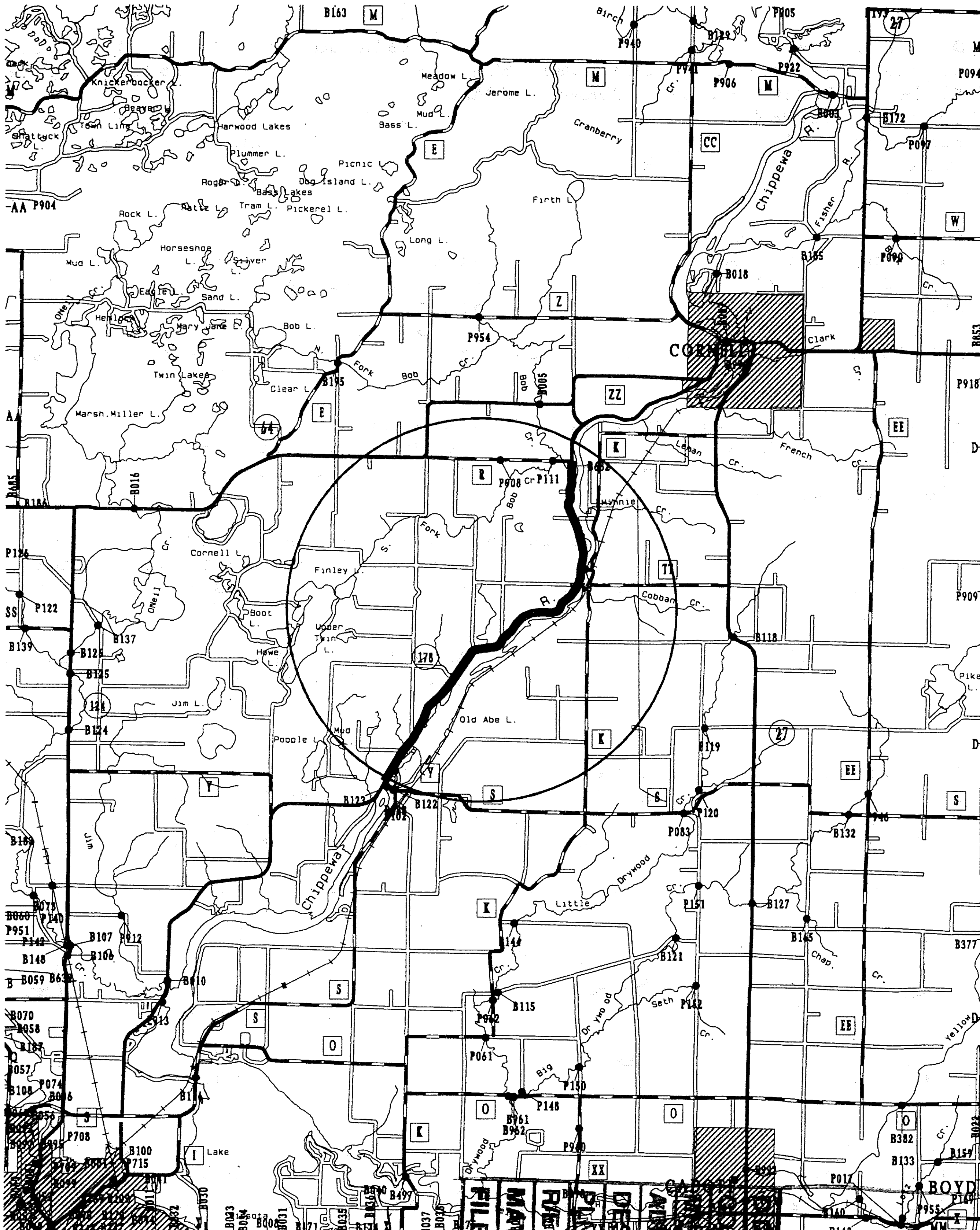
==========

DISTRICT 6 APPROVAL

Project Supervisor — Date: 7-17-96

Planning Supervisor — Date: 17 Jul 96

CC: Gerry Feiler - Rm 951, Len Stanek - Rm 651, Bureau of Environment - Rm 451
Gene Hoelker - FHWA
District 6 Geographic Information System



CHIPPEWA COUNTY
PROJECT ID 8600-02-71

Dist. 6 Rec'd
JUL 17 1996

FILE	COL X 7/18
MAT'L	X
R/W	RWL
PLN.	MAP 7/17
DES.	X

CORRESPONDENCE/MEMORANDUM State of Wisconsin
DISTRICT #6

Date: July 16, 1998

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: **PAVEMENT DESIGN REPORT**
Approval Letter

Project I.D. 8600-02-01
Chippewa Falls - Cornell Road
Jim Falls - CTH R
STH 178
Chippewa County

Upon review of the attached pavement design documentation, the pavement type selection recommendations are approved for the above mentioned project segments.

Reviewed: COMMENTS

7/16/98
Richard J. Shermo, P.E. Date
District #6 Area Supv.-Project Development Section

Approved: COMMENTS

10/20/98
Michael S. Ostrowski, P.E. Date
District #6 Manager-Project Development Section

Have some concern about the slight horizontal alignment "shifts" which puts New & over the old ditch line. Randy, can you set up a meeting so the 4 of us can discuss? Week of Aug 3rd.
MSO

RJS 7/16/98
MSO 7/23/98
MMH 7/23/98

Last → RWL ____

CORRESPONDENCE/MEMORANDUM State of Wisconsin
DISTRICT #6

Date: July 16, 1998

To: File

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Jim Falls - CTH R
STH 178
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District #6 Manager-Project Development Section

State of Wisconsin
Transportation District #6

CORRESPONDENCE/MEMORANDUM

Date: July 16, 1998

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: Pavement Design Report
Project 8600-02-01
Chippewa Falls - Cornell
Jim Falls - CTH R
STH 178
Chippewa County

EXECUTIVE SUMMARY

This report makes the following recommendations for the proposed reconstruction project.

LOCATION	PAVEMENT STRUCTURE	THICKNESS
STH 178-mainline & bypass lanes	Asphalt/ Base Course/ Sand Lift	125mm/275mm/275mm (5") /(11") /(11")
Side Roads >500 ADT	Asphalt/ Base Course	100mm/300mm (4") /(12")
Side Roads <500 ADT	Asphalt/Base Course	75mm /225mm (3") /(9")

Type MV Asphaltic Concrete Pavement mix with PG grade 58-28 should be used for this project. It is anticipated that by the time this plan is let to bid, a different PG graded oil could be the standard. The designer should coordinate the special provisions to reflect the correct AC type.

The 125mm(5") asphalt pavement should be constructed with two lower layers totaling 85mm(3 ½") and a upper layer of 40mm(1 ½"). The 100mm(4") asphalt pavement should be constructed with a 50mm(2") lower layer and a 50mm(2") upper layer. The 75mm(3") asphalt pavement should be constructed with two layers.

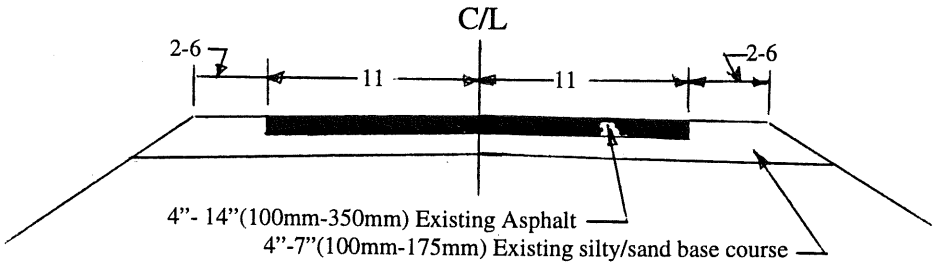
The sand lift should be specified to meet Grade #1 requirements as specified in the Standard Specifications Section 209.2.2 for granular backfill.

EXISTING CONDITIONS

This 11.9km(7.4 mile) project involves the portion of STH 178 from the intersection of CTH Y at Jim Falls northerly along the Chippewa River to the intersection of CTH R. Due to a high accident rate, as stated in the CDR, the roadway will be reconstructed to C3 standards. This roadway is not being reconstructed due to excessive pavement failures or deficiencies. It appears that the roadway was last resurfaced in 1981 with a maintenance type overlay. The 1996 PDI ranged from 28-75 for this section. The 1997 IRI ranged from 1.4-3.6.

In 1993, the roadway core was investigated for a resurfacing type project. Since that time, the concept was revised to a reconstruct type improvement. The 1993 borings are located in the technical services project records.

EXISTING TYPICAL



TRAFFIC PROJECTIONS

The construction year- 0 year ADT is 2000 and the 20 year ADT is projected to be 2400.

Truck percentages are as follows:

TRUCK TYPE	%
2D	3.6
3AX	1.3
2SI,2S2	0.8
3-S2	2.3
DBL.BTM	0.0
TOTAL	8.0

PROPOSED IMPROVEMENT

This project is currently scheduled for a reconstruct(RECST) type improvement. The existing roadway will be reconstructed to C3 standards which will include adjustments to the horizontal and vertical alignments.

SOIL ENGINEERING FACTORS

Over the length of this project, many different soil series are located under the roadway. The roadway core itself, as revealed in the 1993 roadway borings, has various amounts of silt and topsoil present along with some granular material in some of the fill locations. With the existing roadway material varying from moist to wet, construction could be a problem. With the existing silty materials in mind, it was agreed to with the Soils Engineer- Lary Hyland that a sand lift would be the best choice in this situation. For further discussion see the "alternative evaluated section". The DGI recommended for this roadway is 14 with a soil support value of 4.0. At the time of this report, due to the uncertainty of the horizontal and vertical alignment only a preliminary soils analysis has been completed.

FRICTION CHARACTERISTICS

The aggregate is expected to be igneous with 0% dolomite and a 20% L.A. wear resulting in a friction number of 44 and 51 for the PCC. Friction is not expected to be a problem.

ALTERNATIVES EVALUATED and RECOMMENDATIONS

Alternative Discussion

Initially, this segment of roadway was scheduled for a maintenance type overlay in 1998. That project was scrapped and the roadway segment is now being evaluated as a reconstruct to C3(100KM/60MPH) standards. In January 1997, the project was explained to me as a typical shoulder widening project on the south end with some short segments of relocation from the middle of the project northward to CTH R. Since that time, evaluation by the development staff has led to a concept of a total reconstruction.

I have numerous concerns that need to be addressed. The horizontal alignment, provided at the time of this report, continually drifts on and off the centerline of the existing road core in a range of 0-8 feet(0-2.5m). We have had past mid lane failures in minor grading areas when part of the old core supports the new lane and new material is added adjacent to support the remaining lane. Besides the obvious heave potential of the different materials, differential settlement occurs in the new material due to different compaction levels of the new material versus the old road core. As shown on the plan sheets and preliminary sections, in many cases, the subgrade point is being moved out over wet silty marshy material in the old ditches. Also in many locations, water is within 2-3 feet of the pavement surface. At this point in the design process, I can only assume that the designer will follow through with his/her responsibility to provide information to and coordinate with the district Soils Engineer to identify and treat these problem areas once the final horizontal and vertical alignment is chosen. In past situations of widening over old ditches, these areas have either been excavated and back-filled or a grid/back-fill combination was used. The high water table is a separate issue, as obviously it is hard to construct a stable subgrade within 1-2 feet of the existing water elevation. There is a reasonable chance that the asphalt/base/sand lift pavement will not perform in this situation . The designer should remember that a sand lift or breaker run platform will typically push the subgrade to 2 feet or greater below the finished profile.

Alternative Discussion-cont.

On other projects/roadways of this type, past experience had led to a district sequence of operations where the horizontal alignment is left in place and the shoulders are widened and raised to the existing profile. If a sag vertical deficiency exists in this area we will typically gravel lift up to a foot to improve the profile. Crest and sag verticals are routinely excepted to standards of 40 mph if there is no accident history at that location. After the widening or lifting is completed the traveled way surface is addressed with some type of overlay or mill/pulverize & relay and overlay combination, always taking care to remain in the middle of the old roadway core. We typically do experience some shoulder distortion but it is not critical to the performance of the pavement. Besides achieving pavement performance, this operation also has the benefit of providing adequate local access because, typically 2 lane traffic can be provided in the off hours and on weekends during the life of the project.

With reconstruction of the existing STH 178 roadway the project option chosen versus the above mentioned scenario, local access and staging of construction activities will both play major roles in the plan development. Since local access will need to be provided, I am assuming a grading operation will need to be completed one half at a time with excavation, EBS, back-fill, borrow, sand lift and base course progressing down the roadway as access permits. The relocation areas are typically completed separately with the old road in these relocated areas being obliterated at the end. For the sand lift to perform in the pavement structure, the sand cannot be placed on a rutted un-rolled subgrade. This typically requires the contractor to exercise care in the placing of the lift material. Some type of drain will be required at the low points in the sand lift profile. A breaker run was not chosen due the availability of local materials.

With this type of work, it is beneficial to work during the dry part of the summer. Even with these precautions, there is a reasonable chance that stage construction grading might not be completed in one year. Soft spots in the base could be common place under the reconstruct option. If the base course and the two lower layers were placed in year one, the surface layer could be placed the following year. This approach would allow some repair of the broken up areas prior to the final surface being placed.

SUMMARY OF COSTS-----*LCCA*

A twenty year service life was used.

The first alternative is : 175mm(7") PCC over 150mm(6") base over sand lift:
$219008 per KM for initial construction cost
$ 11463 per KM for Equivalent Uniform Annual Cost

The second alternative is : 125mm(5") AC over 275mm(11") base course over 275mm(11") sand lift:
$155257 per KM for initial construction cost
$ 9759 per KM for Equivalent Uniform Annual Cost

The third alternative is : 140mm(5 ½")AC over 300(12") base course *
$157763 per KM for initial construction cost
$ 9921 per KM for Equivalent Uniform Annual Cost

* Not recommended due to sand lift requirement. For information purposes only

RECOMMENDATIONS

LOCATION	PAVEMENT STRUCTURE	THICKNESS
STH 178-mainline & bypass lanes	Asphalt/ Base Course/ Sand Lift	125mm/275mm/275mm (5") /(11") /(11")
Side Roads >500 ADT	Asphalt/ Base Course	100mm/300mm (4") /(12")
Side Roads <500 ADT	Asphalt/Base Course	75mm /225mm (3") /(9")

Type MV Asphaltic Concrete Pavement mix with PG grade 58-28 should be used for this project. It is anticipated that by the time this plan is let to bid, a different PG graded oil could be the standard. The designer should coordinate the special provisions to reflect the correct AC type.

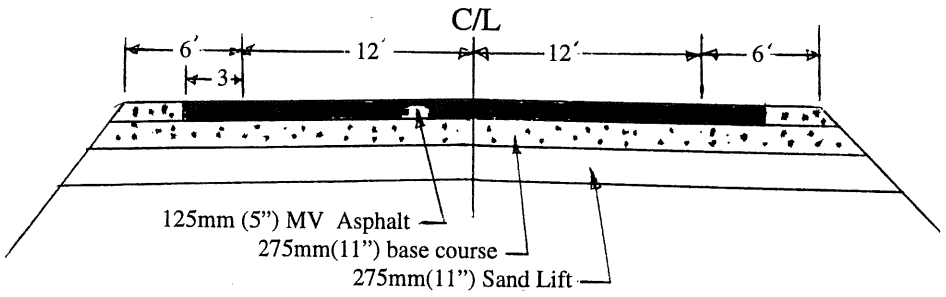
The 125mm(5") asphalt pavement should be constructed with two lower layers totaling 85mm(3 ½") and a upper layer of 40mm(1 ½"). The 100mm(4") asphalt pavement should be constructed with a 50mm(2") lower layer and a 50mm(2") upper layer. The 75mm(3") asphalt pavement should be constructed with two layers.

The sand lift should be specified to meet Grade #1 requirements as specified in the Standard Specifications Section 209.2.2 for granular backfill.

The designer should use asphaltic surface items for incidental asphalt work such as driveways, safety islands, etc. as allowed under the 1997 Supplemental Specs.

Randy W. Luedtke, P.E.

PROPOSED TYPICAL



RIGID PAVEMENT DESIGN WORKSHEET

Version 3.3

07/13/98

8600-02-01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

TRAFFIC:

CONSTRUCTION YEAR	2002
CONSTRUCTION YEAR ADT	2,000
DESIGN YEAR	2022
DESIGN YEAR ADT	2,400
DIRECTIONAL FACTOR (DF)	0.50
LANE DISTRIBUTION FACTOR (LDF)	1.00
TRAFFIC ANALYSIS PERIOD	20.0
DESIGN LANE TRAFFIC (DLT)	1,100

LOADING:

TRUCK TYPE	% OF ADT	DLT	# TRUCKS	ESAL LOAD FACTOR	ESAL'S
2D	3.6	1,100	40	0.3	12
3-SU	1.3	1,100	14	1.2	17
2S-1,2S-2	0.8	1,100	9	0.6	5
3S-2	2.3	1,100	25	1.6	40
DBL BTM	0.0	1,100	0	2.1	0
DESIGN LANE DAILY ESAL's	8.0				74
DESIGN LANE TOTAL LIFE ESAL's					540,200

SOILS:

MODULUS OF SUBGRADE REACTION (K)	30

THICKNESSES:

CALCULATED PAVEMENT THICKNESS	155
PAVEMENT THICKNESS TO BE USED	175

FLEXIBLE PAVEMENT DESIGN WORKSHEET

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07/13/98

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TRAFFIC:

CONSTRUCTION YEAR	2002
CONSTRUCTION YEAR ADT	2,000
DESIGN YEAR	2022
DESIGN YEAR ADT	2,400
DIRECTIONAL FACTOR (DF)	0.50
LANE DISTRIBUTION FACTOR (LDF)	1.00
TRAFFIC ANALYSIS PERIOD	20.0
DESIGN LANE TRAFFIC (DLT)	1,100

LOADING:

TRUCK TYPE	% OF ADT	DLT	# TRUCKS	ESAL LOAD FACTOR	ESAL's
2D	3.6	1,100	40	0.3	12
3–SU	1.3	1,100	14	0.8	11
2S–1,2S–2	0.8	1,100	9	0.5	4
3S–2	2.3	1,100	25	0.9	23
DBL BTM	0.0	1,100	0	2.0	0
DESIGN LANE DAILY ESAL's	8.0				50
DESIGN LANE TOTAL LIFE ESAL's					365,000

SOILS:

DESIGN GROUP INDEX	14
SOIL SUPPORT VALUE	4.0
FROST INDEX	F–3

DESIGN – SN VALUE & MIX TYPE:

SERVICEABILITY INDEX	3.0
REQUIRED SN VALUE	3.49

ASPHALT MIX TYPE: MV

ALTERNATE DESIGN:

LAYER	Asphalt/base/sand THICKNESS	COEFF.	SN	Asphalt/base THICKNESS	COEFF.	SN
SURFACE:	**SURFACE**			**SURFACE**		
ASPHALTIC CONCRETE	125	0.0173	2.16	140	0.0173	2.42
EXISTING ASPHALT		0.0100	0.00			0.00
BASE COURSE:	**BASE**			**BASE**		
CRUSHED AGG. BASE COURSE	275	0.0039	1.07	300	0.0039	1.17
OPEN GRADED BASE COURSE #1			0.00			0.00
OPEN GRADED BASE COURSE #2			0.00			0.00
EXISTING BASE		0.0039	0.00		0.0039	0.00
EXISTING AC			0.00			0.00
PULVERIZED AC			0.00			0.00
EXISTING PCC			0.00			0.00
RUBBLIZED PCC			0.00			0.00
CRACK (BREAK) & SEAT PCC			0.00			0.00
SUBBASE COURSE:	**SUBBASE**			**SUBBASE**		
CRUSHED AGG. BASE COURSE			0.00			0.00
BREAKER RUN			0.00			0.00
GRANULAR SUBBASE	275	0.0012	0.33			0.00
EXISTING SAND LIFT		0.0025	0.00		0.0025	0.00
TOTAL SN VALUE			3.57			3.59

FLEXIBLE PAVEMENT DESIGN

ALTERNATE DESIGN:

LAYER	Existing Structure THICKNESS	COEFF.	SN	THICKNESS	COEFF.	SN
SURFACE:		**SURFACE**			**SURFACE**	
ASPHALTIC CONCRETE	125	0.0173	2.16		0.0173	0.00
EXISTING ASPHALT			0.00			0.00
BASE COURSE:		**BASE**			**BASE**	
CRUSHED AGG. BASE COURSE			0.00		0.0039	0.00
OPEN GRADED BASE COURSE #1			0.00			0.00
OPEN GRADED BASE COURSE #2			0.00			0.00
EXISTING BASE	125	0.0039	0.49			0.00
EXISTING AC			0.00			0.00
PULVERIZED AC			0.00			0.00
EXISTING PCC			0.00			0.00
RUBBLIZED PCC			0.00			0.00
CRACK (BREAK) & SEAT PCC			0.00			0.00
SUBBASE COURSE:		**SUBBASE**			**SUBBASE**	
CRUSHED AGG. BASE COURSE			0.00			0.00
BREAKER RUN			0.00			0.00
GRANULAR SUBBASE			0.00		0.0012	0.00
EXISTING SAND LIFT		0.0025	0.00			0.00
TOTAL SN VALUE			2.65			0.00

SN is Less Than SNreq'd

PAVEMENT SURFACE FRICTION DESIGN

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TRAFFIC:

CONSTRUCTION YEAR ADT	2,000		
DESIGN YEAR ADT	2,400	EXP. GROWTH RATE	0.92%
DIRECTIONAL FACTOR (DF)	0.50		
LANE DISTRIBUTION FACTOR (LDF)	1.00		
% HEAVY VEHICLES (HV)	8.0		
AC PAVEMENT AGE OR SERVICE LIFE (YR)	15.0	AC "AGE" ADT	2,293
AC LAVP AT SPECIFIED AGE (IN MILLIONS)	5.876		
PC PAVEMENT AGE OR SERVICE LIFE (YR)	25.0	PC "AGE" ADT	2,512
PC LAVP AT SPECIFIED AGE (IN MILLIONS)	10.293		

AGGREGATE PROPERTIES:

	AC MIX AGGREGATES	PCC MIX AGGREGATES
% DOLOMITE	0	0
% LA WEAR	20	20

AC AGGREGATE SOURCE:
PCC AGGREGATE SOURCE:

DESIGN:

ASPHALTIC SURFACE FORMULA

$$FN40 = 41.4 - 1.45 \ln(LAVP) + 0.245(LAWEAR) - 0.00075(DOLOMITE)^2$$

FN40 AT SPECIFIED PAVEMENT AGE	43.7
% PROBABILITY THAT CALCULATED VALUE IS < 35	7.9

AGE (YR) WHEN FN40=35	AGE>50

CONCRETE SURFACE FORMULA

$$\ln(FN40) = 3.99 - 0.0419\ln(LAVP) - 0.00129(DOLOMITE) + 0.00474(HV)$$

FN40 AT SPECIFIED PAVEMENT AGE	50.9
% PROBABILITY THAT CALCULATED VALUE IS < 35	<0.05%

AGE (YR) WHEN FN40=35	AGE>50

BID ITEM COSTS

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BID ITEM	BID ITEM #	UNITS	UNIT COST
ASPHALTIC MATERIAL FOR TACK COAT	40204	L	$1.00
ASPHALTIC MATERIAL FOR PLANT MIXES	40501	Mg	$155.00
ASPHALTIC CONCRETE PAVEMENT, TYPE HV	40712	Mg	$22.00
ASPHALTIC CONCRETE PAVEMENT, TYPE MV	40713	Mg	$16.50
ASPHALTIC CONCRETE PAVEMENT, TYPE LV	40714	Mg	$16.50
RECYCLED ASPHALTIC SURFACE, TYPE HV	90381	Mg	
RECYCLED ASPHALTIC SURFACE, TYPE MV	90382	Mg	
RECYCLED ASPHALTIC SURFACE, TYPE LV	90383	Mg	
CONCRETE PAVEMENT, 150 mm	41506	sm	$13.50
CONCRETE PAVEMENT, 175 mm	41507	sm	$18.00
CONCRETE PAVEMENT, 200 mm	41508	sm	$18.00
CONCRETE PAVEMENT, 225 mm	41509	sm	$20.25
CONCRETE PAVEMENT, 250 mm	41510	sm	
CONCRETE PAVEMENT, 275 mm	41511	sm	
CONCRETE PAVEMENT, 300 mm	41512	sm	
CONCRETE WIDENING	41530	sm	
CONTINUOUS CONCRETE PAV'T REINFORCEMENT	41551	sm	
PAVEMENT TIES	41571	EACH	$5.00
DOWEL BARS	41572	EACH	$5.00
CRUSHED AGGREGATE BASE COURSE	30404	Mg	$7.75
OPEN GRADED BASE COURSE #1	30418	Mg	$9.00
OPEN GRADED BASE COURSE #2	30420	Mg	$9.00
ASPHALTIC BASE COURSE	30601	Mg	
ASPHALTIC BASE COURSE WIDENING	30606	Mg	
CONCRETE BASE COURSE	30706–9	sm	
CONCRETE BASE COURSE WIDENING	30751	sm	
BREAKER RUN	30426	Mg	$7.00
GRANULAR SUBBASE COURSE	21201	cm	$3.30
MILL AND RELAY ASPHALTIC CONCRETE PAVEMENT		sm	$0.86
SALVAGED ASPHALTIC PAVEMENT	41010	Mg	
SALVAGED ASPHALTIC PAVEMENT, MILLING	41020	Mg	$7.72
ASPHALTIC SURFACE, PATCHING	41102	Mg	
PULVERIZING ASPHALTIC CONCRETE PAVEMENT		sm	$0.70
BASE PATCHING, ASPHALTIC	30810	sm	
BASE PATCHING, CONCRETE	30820	sm	$40.95
CRACKING AND SEATING CONCRETE PAVEMENT	41040	sm	
BREAKING AND SEATING CONCRETE PAVEMENT		sm	
CONCRETE PAVEMENT REPAIR	41574	cm	$183.00
CONTINUOUS DIAMOND GRINDING	41576	sm	$2.69
RUBBLIZING CONCRETE PAVEMENT		sm	
CONCRETE CURB & GUTTER, 750 mm, TYPE A	60123	m	
CONCRETE CURB & GUTTER, 750 mm, TYPE D	60133	m	
GEOTEXTILE FABRIC, TYPE DF	64503	sm	$1.20
PIPE UNDERDRAIN, 150 mm	61201	m	$4.43
PIPE UNDERDRAIN, UNPERFORATED, 150 mm	61211	m	$22.15
R.C. APRON ENDWALLS FOR UNDERDRAIN	61254	EACH	$125.00
REMOVING PAVEMENT	20401	sm	
GEO–GRID	'90xxx	sm	$1.75

ALTERNATE DESCRIPTION WORKSHEET

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PARAMETER	UNITS	ALT 1 VALUE	ALT 2 VALUE	ALT 3 VALUE	ALT 4 VALUE	ALT 5 VALUE	ALT 6 VALUE
RURAL OR URBAN PROJECT	R/U	r	r	r			
ROADWAY WIDTH	m	10.80	10.80	10.80			
PAVEMENT STRUCTURE WIDTH	m	7.20	7.20	7.20			
TOTAL PAVED SHOULDER WIDTH	m	1.80	1.80	1.80			
CONCRETE RDWY PAVEMENT THICKNESS	mm	175					
CONCRETE SHOULDER THICKNESS	mm	175					
AC RDWY PAVEMENT MIX TYPE	HV/MV/LV		MV	MV			
TOTAL AC RDWY PAVEMENT THICKNESS	mm		125	140	125		
VIRGIN AC RDWY PAVEMENT THICKNESS	mm		125	140			
% OF ASPHALT CEMENT USED	%		6.0	6.0			
RECYCLED AC RDWY PAVEMENT THICKNESS	mm						
% OF ASPHALT CEMENT USED	%						
% RAP	%						
AC SHOULDER PAVEMENT MIX TYPE	HV/MV/LV		MV	mv			
TOTAL AC SHOULDER PAVEMENT THICKNESS	mm		125	140			
VIRGIN AC SHOULDER THICKNESS	mm		125	140			
RECYCLED AC SHOULDER THICKNESS	mm						
% OF ASPHALT CEMENT USED	%		6.0	6.0			
ASPHALTIC CONCRETE PAVEMENT WT.	kg/sm/mm	2.35	2.35	2.35	2.35	2.35	2.35
TACK COAT COVERAGE	L/sm	0.113	0.113	0.113	0.113	0.113	0.113
WHICH LAYER IS THE DRAINAGE LAYER?	0-4	0	0	0	0	0	0
CRUSHED AGG. BASE COURSE THICKNESS	mm	150.00	275.00	300.00	0		
UNIT WT OF CABC	Mg/cm	2.4	2.4	2.4			
OPEN GRADED BASE COURSE #1 THICKNESS	mm		0	0	0		
UNIT WT OF OGBC #1	Mg/cm						
OPEN GRADED BASE COURSE #2 THICKNESS	mm			0	0		
UNIT WT OF OGBC #2	Mg/cm						
BREAKER RUN THICKNESS	mm		0	0	0		
UNIT WT OF BREAKER RUN	Mg/cm						
ASPHALTIC STABILIZED B.C. THICKNESS	mm						
% OF ASPHALTIC CEMENT USED	%						
UNIT WT OF AC STABILIZED BASE COURSE	Mg/cm						
P.C. STABILIZED BASE COURSE THICKNESS	mm						
UNIT WT OF PCC STABILIZED BASE COURSE	Mg/cm						
GRANULAR SUBBASE COURSE THICKNESS	mm	275	275	0	0		
OTHER #1 (STRUCTURE WIDTH)	mm						
	Mg/cm						
OTHER #2 (ROADWAY WIDTH)	mm						
	Mg/cm						
EXISTING PAVEMENT WIDTH	m		6.70	6.70			
EXISTING PAVEMENT THICKNESS	mm						
% OF PROJECT LENGTH FOR CURB & GUTTER	%						
TYPE OF CURB & GUTTER	A/D						
% OF PROJECT LENGTH FOR GEOTEXTILE FABRIC	%						
% OF PROJECT LENGTH FOR UNDERDRAINS	%						
% OF PROJECT LENGTH FOR TACK COATING	%		66	66			
TOTAL m2 OF CRCP STEEL REINFORCEMENT	sm						
%OF PROJECT LENGTH FOR MILL & RELAY AC PAV'T	%						
%OF PROJECT PAV'T AREA FOR AC SURF PATCHING	%						
%OF PROJECT LENGTH FOR PULVERIZING AC PAV'T	%						
MILLING DEPTH	mm						
%OF PROJECT LENGTH FOR SALV AC PAV'T MILLING	%						
%OF PROJECT LENGTH FOR SALV AC PAV'T	%						
%OF PROJECT LENGTH FOR DIAMOND GRINDING	%						
%OF PROJECT LENGTH FOR PCC PAV'T REPAIR	%						
#OF PAV'T TIES PER METER OF LONGIT. LENGTH	EACH						
#DOWELS PER PATCH JOINT	EACH						
AVG. LENGTH OF PCC PATCH	m						
%OF PROJECT LENGTH FOR CRACK & SEAT	%						
%OF PROJECT LENGTH FOR BREAK & SEAT	%						
%OF PROJECT LENGTH FOR RUBBLIZING	%						
TOTAL AREA FOR ASPHALTIC BASE PATCHING	sm						
TOTAL AREA FOR CONCRETE BASE PATCHING	sm						
TOTAL AREA FOR CONCRETE WIDENING	sm						
TOTAL AREA FOR AC BASE COURSE WIDENING	sm						
TOTAL AREA FOR PCC BASE COURSE WIDENING	sm						
%OF PROJECT LENGTH FOR PAVEMENT REMOVAL	%						

BASE LAYER: (FOR QUANTITY CALCULATIONS)

X – NONE
A – CABC
B – OGBC #1
C – OGBC #2
D – BREAKER RUN
E – AC STABILIZED
F – PC STABILIZED
G – GRANULAR
H – OTHER #1
I – OTHER #2

	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5	ALT 6
LAYER 1	a	a	a	x	x	x
LAYER 2	g	g	x	x	x	x
LAYER 3	X	X	X	X	X	X
LAYER 4	X	X	X	X	X	X

ALTERNATE QUANTITIES AND COSTS

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PARAMETER	UNITS	ALTERNATIVE #1 PCC		ALTERNATE #2 Asphalt/base/sand		ALTERNATE #3 Asphalt/base	
		QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
CONCRETE PAVEMENT (RDWY)	sm	7,200.0	$129,600.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT (SHOULDERS)	sm	1,800.0	$32,400.00	0.0	$0.00	0.0	$0.00
VIRGIN AC PAVEMENT (RDWY)	Mg	0.0	$0.00	2,115.0	$34,897.50	2,368.8	$39,085.20
VIRGIN AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	528.8	$8,724.38	592.2	$9,771.30
RECYCLED AC PAVEMENT (RDWY)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
RECYCLED AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALT CEMENT	Mg	0.0	$0.00	158.6	$24,586.88	177.7	$27,537.30
CRUSHED AGG. BASE COURSE	Mg	5,658.0	$43,849.50	9,204.0	$71,331.00	10,239.4	$79,355.04
OPEN GRADED BASE COURSE #1	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
OPEN GRADED BASE COURSE #2	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAKER RUN	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
GRANULAR SUBBASE COURSE	cm	3,987.5	$13,158.75	4,152.5	$13,703.25	0.0	$0.00
CURB & GUTTER	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
TYPE DF GEOTEXTILE FABRIC	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
150 mm PIPE UNDERDRAINS	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
150mm PIPE UNDERDRAINS,UNPERFORATED	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
APRON ENDWALLS FOR UNDERDRAINS	EACH	0	$0.00	0	$0.00	0	$0.00
TACK COATING	L	0.0	$0.00	2,013.7	$2,013.66	2,013.7	$2,013.66
MILL & RELAY AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT,MILLING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC SURFACE PATCHING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
PULVERIZING AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONTINUOUS DIAMOND GRINDING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT REPAIR	cm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CRCP REINFORCEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
PAVEMENT TIES	EACH	0	$0.00	0	$0.00	0	$0.00
DOWEL BARS	EACH	0	$0.00	0	$0.00	0	$0.00
CRACK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
RUBBLIZING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE WIDENING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
REMOVING PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
Cost Adjustment - see comps							
OTHER BASE #1	Mg	0.0		0.0		0.0	
OTHER BASE #2	Mg	0.0		0.0		0.0	
ALTERNATIVE TOTAL			$219,008.25		$155,256.66		$157,762.50

ALTERNATE QUANTITIES AND COSTS

PARAMETER	UNITS	ALTERNATE #4 Existing Structure		ALTERNATE #5 0		ALTERNATE #6 0	
		QUANTITY	COST	QUANTITY	COST	QUANTITY	COST
CONCRETE PAVEMENT (RDWY)	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT (SHOULDERS)	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
VIRGIN AC PAVEMENT (RDWY)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
VIRGIN AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
RECYCLED AC PAVEMENT (RDWY)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
RECYCLED AC PAVEMENT (SHOULDERS)	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALT CEMENT	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CRUSHED AGG. BASE COURSE	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
OPEN GRADED BASE COURSE #1	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
OPEN GRADED BASE COURSE #2	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAKER RUN	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
GRANULAR SUBBASE COURSE	cm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CURB & GUTTER	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
TYPE DF GEOTEXTILE FABRIC	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
150 mm PIPE UNDERDRAINS	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
150mm PIPE UNDERDRAINS,UNPERFORATED	m	0.0	$0.00	0.0	$0.00	0.0	$0.00
APRON ENDWALLS FOR UNDERDRAINS	EACH	0	$0.00	0	$0.00	0	$0.00
TACK COATING	L	0.0	$0.00	0.0	$0.00	0.0	$0.00
MILL & RELAY AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT,MILLING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
SALVAGED ASPHALTIC PAVEMENT	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC SURFACE PATCHING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
PULVERIZING AC PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONTINUOUS DIAMOND GRINDING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE PAVEMENT REPAIR	cm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CRCP REINFORCEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
PAVEMENT TIES	EACH	0	$0.00	0	$0.00	0	$0.00
DOWEL BARS	EACH	0	$0.00	0	$0.00	0	$0.00
CRACK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
BREAK & SEATING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
RUBBLIZING CONCRETE PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE PATCHING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
ASPHALTIC BASE COURSE WIDENING	Mg	0.0	$0.00	0.0	$0.00	0.0	$0.00
CONCRETE BASE COURSE WIDENING	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
REMOVING PAVEMENT	sm	0.0	$0.00	0.0	$0.00	0.0	$0.00
Cost Adjustment--see comps							
OTHER BASE #1	Mg	0.0		0.0		0.0	
OTHER BASE #2	Mg	0.0		0.0		0.0	
ALTERNATIVE TOTAL			$0.00		$0.00		$0.00

ALTERNATE MAINTENANCE

Version 3.3

07/13/98

8600–02–01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

MAINTENANCE COSTS: (CURRENT YEAR)

ALTERNATE TITLE	INCREMENT 1		INCREMENT 2		INCREMENT 3		INCREMENT 4		INCREMENT 5	
	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR
PCC	12	13	17	18	24	25	27	28	33	34
YEARLY COST	$2,400.00		$4,970.00		$4,970.00		$4,970.00		$1,250.00	
Asphalt/base/sand	2	3	9	10	16	17	22	23	28	29
YEARLY COST	$1,250.00		$1,550.00		$1,250.00		$1,550.00		$1,250.00	
Asphalt/base	2	3	9	10	16	17	22	23	28	29
YEARLY COST	$1,250.00		$1,550.00		$1,250.00		$1,550.00		$1,250.00	
Existing Structure										
YEARLY COST										
0										
YEARLY COST										
0										
YEARLY COST										

MAINTENANCE COSTS: (CURRENT YEAR)

ALTERNATE TITLE	INCREMENT 6		INCREMENT 7		INCREMENT 8		INCREMENT 9		INCREMENT 10	
	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR	FROM YEAR	TO YEAR
PCC	37	38	43	44	47	48				
YEARLY COST	$1,550.00		$1,250.00		$1,550.00					
Asphalt/base/sand	34	35	40	41	47	48				
YEARLY COST	$1,550.00		$1,250.00		$1,550.00					
Asphalt/base	34	35	40	41	47	48				
YEARLY COST	$1,550.00		$1,250.00		$1,550.00					
Existing Structure										
YEARLY COST										
0										
YEARLY COST										
0										
YEARLY COST										

ALTERNATE REHABILITATION

Version 3.3

07/13/98

8600-02-01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

ASPHALT PAVEMENT REHABILITATION SCHEMES:

SCHEME	Mill / Overlay Limits 1: RDWY ONLY 2:RDWY & Shoulders	MILLING DEPTH (mm)	% OF PROJECT for SURF. PATCHING	OVERLAY THICKNESS (mm)	MIX TYPE (HV,MV,LV)	% AC in OVERLAY MIX	OTHER COSTS	OTHER COST DESCRIPTION
AC1	2	0	0.0	75	mv	6.0		
AC2	2	25	0.0	90	mv	6.0		
AC3	2	50	0.0	100	mv	6.0		Similar costs to mill&relay and new asphalt
AC4								
AC5								
AC6								
AC7								
AC8								
AC9								

RECONSTRUCT: USING ORIGINAL AC LAYER THICKNESSES

CONCRETE PAVEMENT REHABILITATION SCHEMES:

Repair – Grind SCHEMES	% PCC REPAIR	AVG PATCH LENGTH in m	# DOWELS PER JOINT	% OF PROJECT for PCC Base Patching		OTHER COSTS	OTHER COST DESCRIPTION
PC1	0.0	1.8	32	0.0	& Continuous Grind		
PC2	0.0	1.8	32	1.0	& Continuous Grind		
PC3					& Continuous Grind		

Repair – Overlay SCHEMES	% PCC REPAIR	AVG PATCH LENGTH in m	# DOWELS PER JOINT	% OF PROJECT for PCC Base Patching	% OF PROJECT for AC Base Patching	OVERLAY THICKNESS (mm)	MIX TYPE (HV,MV,LV)	% AC in OVERLAY MIX	OVERLAY LIMITS 1: RDWY ONLY 2: RDWY & Shoulders	OTHER COSTS	OTHER COST DESCRIPTION
PC4	0.0	1.8	12	5.0	0.0	0		6.0	2		
PC5	0.0	1.8	12	5.0	0.0	75	mv	6.0	2		
PC6											

Mill – Repair – Overlay SCHEMES	Mill / Overlay Limits 1: RDWY ONLY 2:RDWY & Shoulders	MILLING DEPTH (mm)	% PCC REPAIR	AVG PATCH LENGTH in m	# DOWELS PER JOINT	% OF PROJECT for PCC Base Patching	% OF PROJECT for AC Base Patching	OVERLAY THICKNESS (mm)	MIX TYPE (HV,MV,LV)	% AC in OVERLAY MIX	OTHER COSTS
PC7	2	75	0.0	1.8	12	2.0	0.0	75	mv	6.0	
PC8											
PC9											

PC7 OTHER COST DESCRIPTION
PC8 OTHER COST DESCRIPTION
PC9 OTHER COST DESCRIPTION

SCHEME
PC10
PC11

CONTINUOUS DIAMOND GRIND ONLY
RECONSTRUCT: USING ORIGINAL PCC LAYER THICKNESSES

OTHER COSTS	OTHER COST DESCRIPTION

ALTERNATE REHABILITATION SCENARIOS:

REHABILITATION COSTS (COSTS ARE CURRENT YEAR)	ALT. #1: PCC			ALT. #2: Asphalt/base/sand			ALT. #3: Asphalt/base			ALT. #4: Existing Structure		
	SPACING	TYPE	CURRENT YR COST	SPACING	TYPE	CURRENT YR COST	SPACING	TYPE	CURRENT YR COST	SPACING	TYPE	CURRENT YR COST
FIRST REHABILITATION	20	PC4	$14,742.00	14	AC2	$57,402.45	14	AC2	$57,402.45			$0.00
SECOND REHABILITATION	10	PC5	$50,212.25	12	AC3	$66,438.90	12	AC3	$66,438.90			$0.00
THIRD REHABILITATION	10	PC7	$61,101.90	12	AC9	$70,222.41	12	AC9	$78,407.46			$0.00
FOURTH REHABILITATION			$0.00			$0.00			$0.00			$0.00
FIFTH REHABILITATION			$0.00			$0.00			$0.00			$0.00
EXPECTED LIFE OF LAST REHABILITATION	10			14			14					
TOTAL LIFE	50			52			52			0		

LIFE CYCLE COST ANALYSIS

Version 3.3

07/13/98

8600-02-01
Chippewa Falls – Cornell
Jim Falls – CTH R
STH 178
Chippewa

CURRENT YEAR	1998	DISCOUNT RATE (%)	5.0
CONSTRUCTION YEAR	2002	PROJECT LENGTH (Km)	1.00
DESIGN YEAR	2022	ANALYSIS BASIS (P/M)	M
ANALYSIS PERIOD	50.0		

	ALT. 1	ALT. 2	ALT. 3	ALT. 4	ALT.5	ALT. 6
TERMINAL SALVAGE VALUE						

PRESENT WORTH COSTS: (CURRENT YEAR)

	ALT. 1 PCC	ALT. 2 Asphalt/base/sand	ALT. 3 Asphalt/base	ALT. 4 Existing Structure	ALT.5 0	ALT. 6 0
INITIAL CONSTRUCTION COSTS	$180,178.63	$127,730.04	$129,791.60	$0.00	$0.00	$0.00
REHABILITATION COSTS	$23,173.16	$48,271.80	$49,326.35	$0.00	$0.00	$0.00
MAINTENANCE COSTS	$5,916.56	$3,441.68	$3,441.68	$0.00	$0.00	$0.00
TERMINAL SALVAGE VALE	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
REHABILITATION SALVAGE VALUE	$0.00	($1,292.49)	($1,443.14)	$0.00	$0.00	$0.00
TOTAL FACILITY COSTS	$209,268.35	$178,151.02	$181,116.49	$0.00	$0.00	$0.00

EQUIVALENT UNIFORM ANNUAL COSTS: (OVER ANALYSIS PERIOD)

	ALT. 1 PCC	ALT. 2 Asphalt/base/sand	ALT. 3 Asphalt/base	ALT. 4 Existing Structure	ALT.5 0	ALT. 6 0
INITIAL CONSTRUCTION COSTS	$9,869.60	$6,996.63	$7,109.56	$0.00	$0.00	$0.00
REHABILITATION COSTS	$1,269.35	$2,644.17	$2,701.94	$0.00	$0.00	$0.00
MAINTENANCE COSTS	$324.09	$188.52	$188.52	$0.00	$0.00	$0.00
TERMINAL SALVAGE VALE	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
REHABILITATION SALVAGE VALUE	$0.00	($70.80)	($79.05)	$0.00	$0.00	$0.00
TOTAL FACILITY COSTS	$11,463.04	$9,758.53	$9,920.97	$0.00	$0.00	$0.00

7/14/98 WISCONSIN DEPARTMENT OF TRANSPORTATION IPFMBC
06:26:33 PAVEMENT INDEX FILE SYSTEM
BROWSE OF CURRENT PDI & PSI VALUES

District 6 County Name CHIPPEWA County Number 9 Highway 178N

Enter S in Opt Field to View Section Data

Opt	From RP + Distance	From Feature	To RP + Distance	*Current* Surface Yr	Ty	*PDI* Survey Yr	No.	*IRI* Survey Yr	mm/m
	011G + 0.000	CTH. Y	012K + 0.000	85	1	96	28	97	1.83
	012K + 0.000	182ND. ST.	014G + 0.000	85	1	96	49	97	1.40
	014G + 0.000	CTH Y INT	015 + 0.000	81	1	96	57	97	2.38
	015 + 0.000	FINLEY LAKE RD	015 + 0.980	81	1	96	76	97	3.08
	015 + 0.980	160TH AVE.	017 + 0.000	87	1	96	34	97	2.75
	017 + 0.000	210TH ST.	018 + 0.000	79	1	96	70	97	3.50
	018 + 0.000	215TH ST.	018 + 0.680	88	1	96	31	97	2.46
	018 + 0.680	SECTION 9 & 10	020 + 0.000	84	1	96	50	97	2.86
	020 + 0.000	180TH AVE	022 + 0.000	88	1	96	41	97	2.97
	022 + 0.000	190TH AVE.	023 + 0.000	83	2	96	75	97	3.58

Surf Type 1=ACPM/FB,2=BRM, 3=ACPM/RB, 4=JRCP, 5=JPCP w/o d, 6=CRCP, 8=JPCP /d

SELECT DATA TO VIEW, OR PRESS ENTER FOR MORE
ENTER TO CONTINUE PF3 OR PF15 TO BROWSE MENU PA2 TO CANCE
PF2 OR PF14 TO PRIMARY MENU PF12 OR PF24 TO LOGOFF CICS

7/14/98
06:26:41

WISCONSIN DEPARTMENT OF TRANSPORTATION
PAVEMENT INDEX FILE SYSTEM
BROWSE OF CURRENT PDI & PSI VALUES

IPFMBC

District 6 County Name CHIPPEWA County Number 9 Highway 178N

Enter S in Opt Field to View Section Data

Opt	From RP	+	Distance	From Feature	To RP	+	Distance	*Current* Surface Yr	Ty	*PDI* Survey Yr	No.	*IRI* Survey Yr	mm/m
	022	+	0.000	190TH AVE.	023	+	0.000	83	2	96	75	97	3.58
	023	+	0.000	CTH R INT	024	+	0.000	87	1	96	38	97	2.60
	024	+	0.000	CTH ZZ INT	024	+	1.250	81	1	96	24	97	2.45
	024	+	1.250	SECTION 25 & 24	027	+	0.000	84	1	96	66	97	2.57
	027	+	0.000	STH 64E	499E	+	0.000						
		+				+							
		+				+							
		+				+							
		+				+							
		+				+							

Surf Type 1=ACPM/FB,2=BRM, 3=ACPM/RB, 4=JRCP, 5=JPCP w/o d, 6=CRCP, 8=JPCP /d

NO MORE SECTIONS FOR COUNTY & HIGHWAY
ENTER TO CONTINUE PF3 OR PF15 TO BROWSE MENU PA2 TO CANCE
PF2 OR PF14 TO PRIMARY MENU PF12 OR PF24 TO LOGOFF CICS

CORRESPONDENCE/MEMORANDUM State of Wisconsin

Date: July 13, 1998

To: File

From: Randy W. Luedtke, P.E.
District #6 Pavement Design Engineer

Subject: Traffic Forecast projection revisions
Project 8600-02-01

This project has been in and out of the six year program for the last 5-10 years. There has been no recent specific traffic forecast done for this segment. For structural design purposes, I chose to use a construction year ADT of 2000 and a 20 year ADT of 2400. The truck percentage was rounded to 8%. The following two forecasts done in 1992 and 1995 give volumes for the roadway but are outdated.

TRAFFIC FORECAST

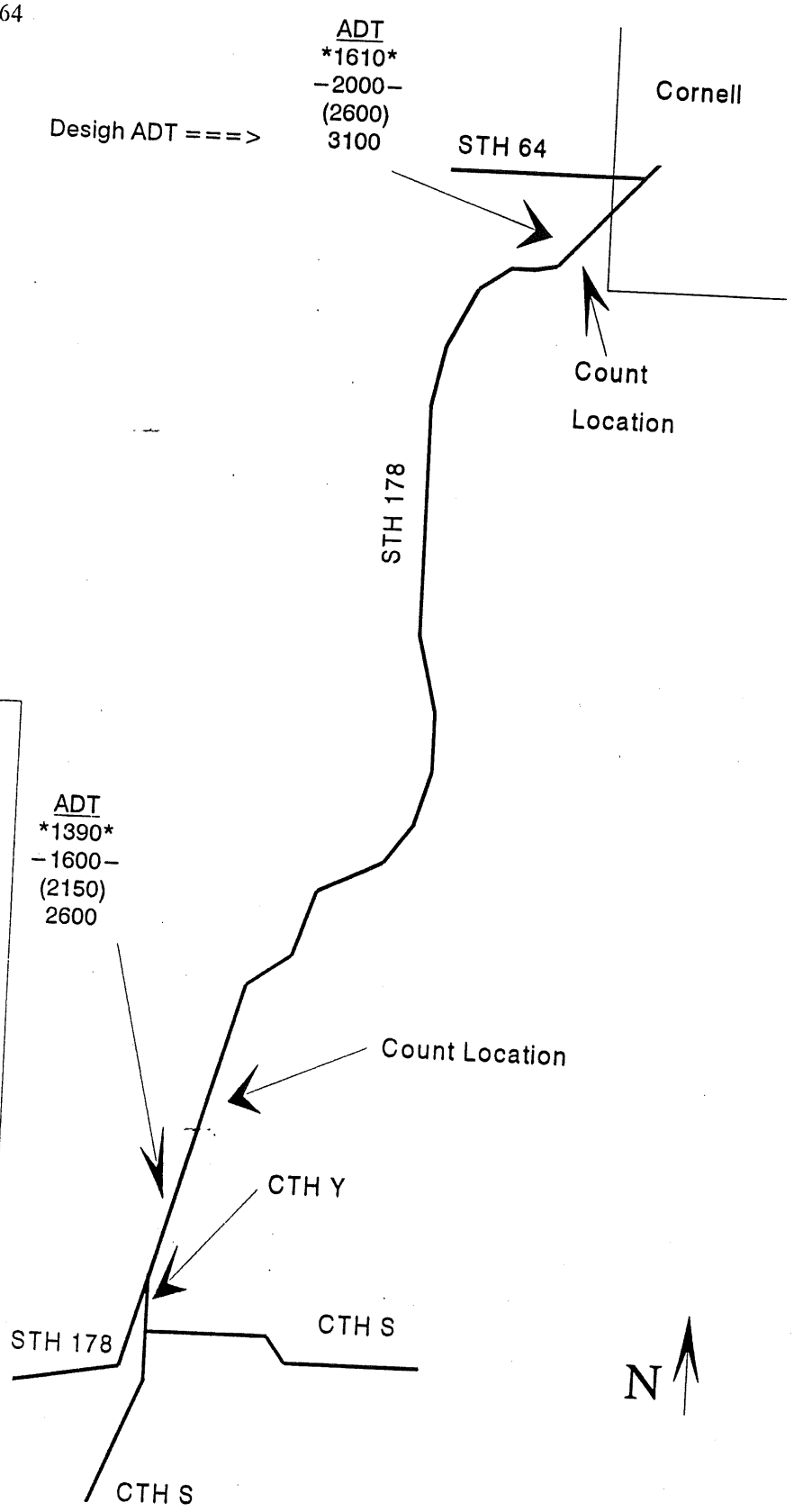
PROJECT ID: 8600-02-71
COUNTY: Chippewa
ROUTE: STH 178
LOCATION: Int. w/ CTH Y to Int. w/ STH 64

KEY	
000	1991 Traffic Count
-000-	1994 Forecast
(000)	2004 Forecast
000	2014 Forecast
DESIGN VALUES	
K100	11.6
K50	12.4
K30	13.1
P(PHV)	16.9
T(DHV)	6.2
T(PHV)	3.5
D	60/40
K8(ADT)	--
T(A8HV)	--

TRUCK CLASS	
TRUCK TYPE	% ADT
2D	3.6
3AX	1.4
2S1+2S2	0.7
3-S2	2.0
DBL-BTM	0.0
TOTAL	7.7

NOTES ON THE ANALYSIS:

1. The functional classification of STH 178 over the project section is COLLECTOR; the seasonal adjustment factor group for the section is group 4.
2. In developing this forecast, it was assumed that no new major traffic generators will be developed in the vicinity of the project section over the course of the forecast period.
4. In developing the forecast for the southern site, the the historical traffic count for 1975 was excluded from the analysis because it departed substantially from the trend in the other historical counts.
5. Truck percentages of ADT were obtained from a table of vehicle type percentages by functional class and urban/rural area because a vehicle type counter is not located on STH 178.
6. Design parameters are calculated using the design year ADT for the northern most forecast location (3100).

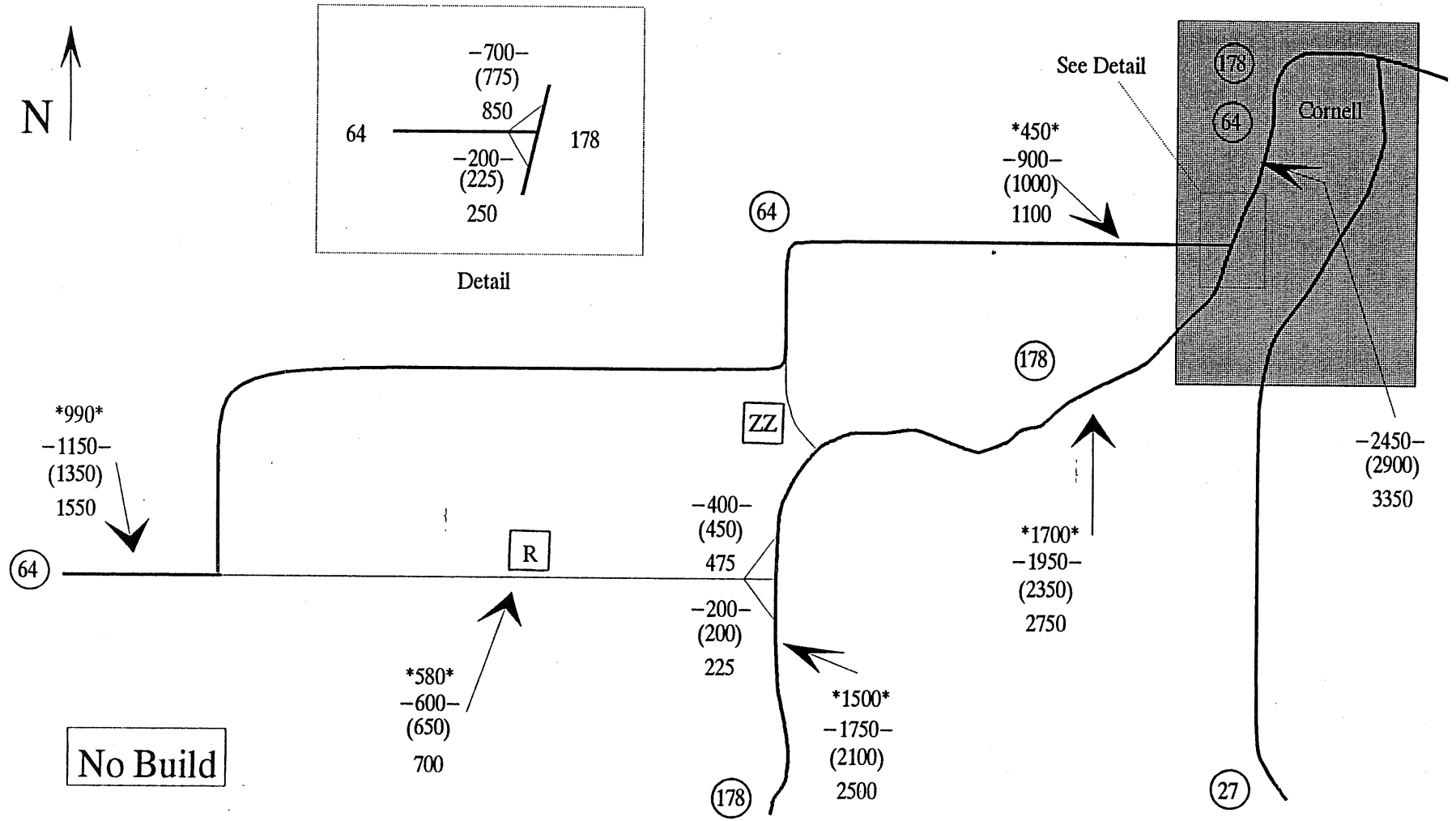


Developed by Keith Wendt, Traffic Forecasting and Analysis Section 14-Sep-92

PROJECT ID: 8191–01–01
COUNTY: Chippewa
ROUTE: STH 64
LOCATION: STH 64: CTH R to STH27
DISTRICT: 6

KEY	
000	1993 ADT
–000–	1999 ADT
(000)	2009 ADT
000	2019 ADT

Developed by Scott Erdman, Traffic Analysis & Forecasting Sect.; Phone: (608) 266–1010;
E–Mail ID: ERDMAS
Completed: 26–Jul–95



DESIGN VALUES	
K100	11.5
K50	12.3
K30	12.9
P(PHV)	16.7
T(DHV)	6.2
T(PHV)	3.5
D	60/40
K8(ADT)	NA
T(A8HV)	NA

TRUCK CLASS	
TRUCK TYPE	% ADT
2D	3.6
3AX	1.4
2S1+2S2	0.7
3–S2	2.0
Dbl–Btm	0.0
TOTAL	7.7

Notes on the Forecast:

1. Historic and projected traffic volumes represent Axle – Adjusted AADT. Pre – 1990 counts are factored using indicated Axle – Adjustment Factors (A–AF).
2. This forecast assumes that no signficant new traffic generators will be developed in the project area during the forecast period.
3. STH 64 has an axle – adjustment factor of .93 and is in Factor Group 4, indicating moderate seasonal traffic fluctuation.

REFERENCES

1. "Wisconsin Highway Traffic", available coverage counts, 1975 – 1993.
2. "Official Poulation Estimates, Demographic Services Center, DOA.

CONCEPT DEFINITION REPORT

Date: 07/17/96 To: Michael A. Cass (P.E.) From: District 6

I. Design ID: 8600-02-01 Related ID(s): 8600-02-71(Const)
Highway No. or Local Road Name: STH 178 8600-02-21 (R/W)
Title: CHIPPEWA FALLS - CORNELL ROAD
County: CHIPPEWA Length: 7.4 Miles 11.9 km
Functional Class: Major Collector Current ADT: 1650 (1993)
LOCATION: CTH Y - CTH R

II. A. Roadway Conditions:
Pavement: Type: AC Width: 22 Year: 1981
PSI: 2.69 (1993) PDI: 30 (1994)
Shoulder: Type: Gravel Width: 2
Accident Rate: 480 Year: 1995
Substandard Alignment: Horizontal: Yes Vertical: Yes

B. Structure: (may be continued on back side)
Type: DECK GIRDER Length: 86.5 ft, 26.4 m
Bridge Number: B-09-0682 Year Constructed: 1942
Clear Roadway Width: 27.6 SR: 80.5 RS: 89.4

JUSTIFICATION: Accident rate is 480 vs State ave of 222 because of narrow shoulders, sharp horiz curvature and short vertical and horiz sight distance. There are many power poles and trees in clear zone.

III. PROPOSED IMPROVEMENT: Grade, Base, Asphaltic Surface to C3 standards with a 24 ft surface on a 36 ft roadway with a 30 ft clear zone.

A. Environmental documentation type: III ER
B. Improvement Type: RECST PMSID: 98060020201
C. Cost: $ 3,850,000 Program Year: 2002 Program: 3334
D. Local Participation: $ No Access Control: No

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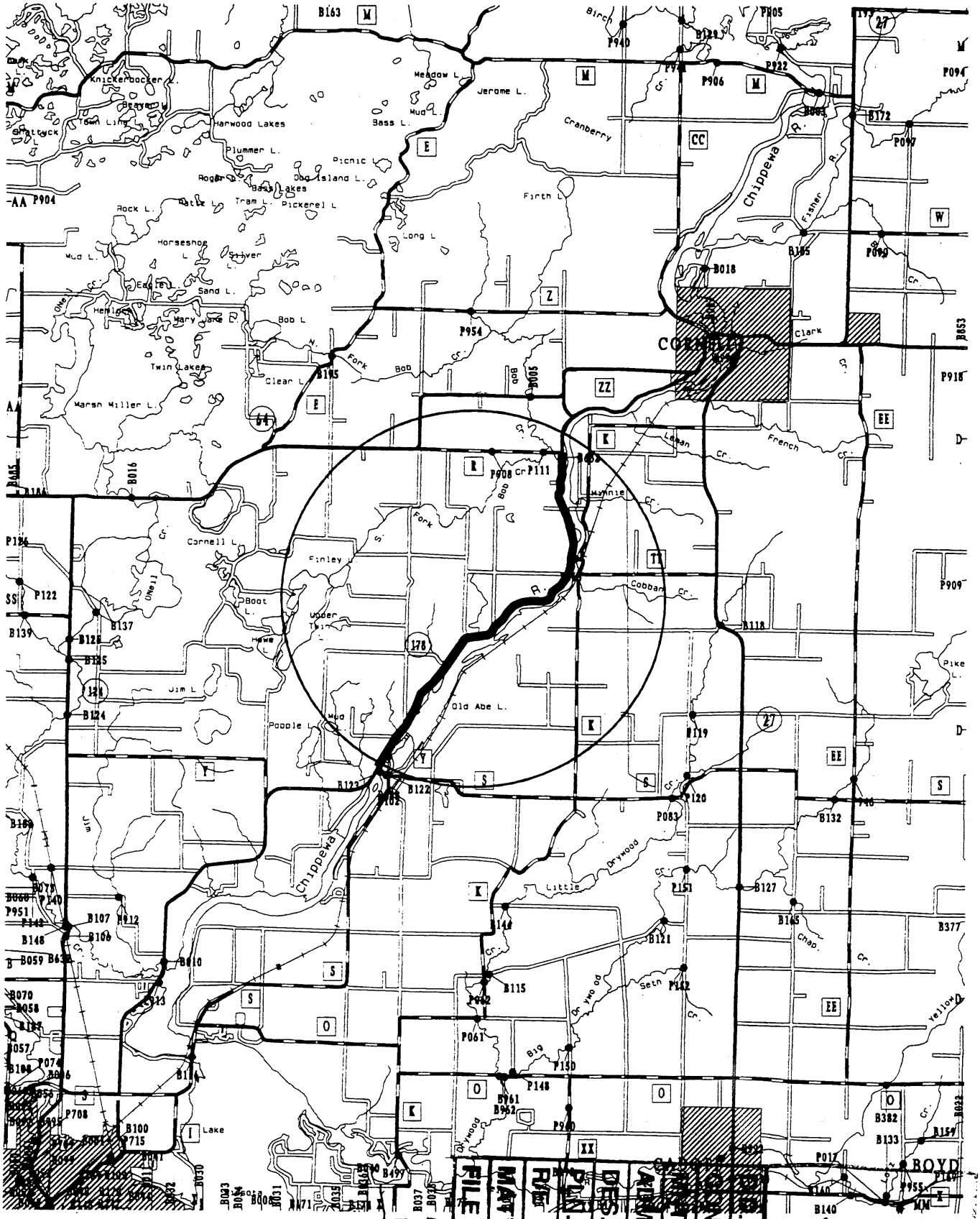
DISTRICT 6 APPROVAL

Cordell Lindell — 7-17-96
Project Supervisor — Date

Mark R Pardun — 17 Jul 96
Planning Supervisor — Date

CC: Gerry Feiler - Rm 951, Len Stanek - Rm 651, Bureau of Environment - Rm 451
Gene Hoelker - FHWA
District 6 Geographic Information System



CHIPPEWA COUNTY
PROJECT ID 8600-02-71