Information for File #2014-03693-WAB

Applicant	Cass County Highway Department
Corps Contact	Bill Baer
Address	4111 Technology Drive, Suite 295, Bemidji MN 56601
E-Mail	william.a.baer@usace.army.mil
Phone	651-290-5338
Primary County	Cass
Sec/Township/Range	From the east quarter corner of S20, T142N, R26W, to the intersection with County State Aid Highway 65 at the NE corner of S31, T143N, R26W
Information Complete On	December 12, 2014
Posting Expires On	January 19, 2015
Authorization Type	LOP-05-MN

This application is being reviewed in accordance with the practices for documenting Corps jurisdiction under Sections 9 & 10 of the Rivers and Harbor Act of 1899 and Section 404 of the Clean Water Act identified in Regulatory Guidance Letter 07-01. We have made a preliminary determination that the aquatic resources that would be impacted by the proposed project are regulated by the Corps of Engineers under Section 404 of the Clean Water Act. Our jurisdictional review and final jurisdictional determination could result in modifications to the scope of the project's regulated water body/wetland impacts and compensatory mitigation requirements identified above. An approved jurisdictional determination will be made prior to reaching a permit decision, and will be posted on the St. Paul District web page at http://www.mvp.usace.army.mil/.

Project Purpose: The purpose of the project is to reconstruct approximately 5.5 miles of Cass County State Aid Highway (CSAH) 4 near Remer, Minnesota to current state-aid design standards and address existing deficiencies. According to the applicant, the existing deficiencies include, but are not limited to, deteriorating pavement conditions, inadequate pedestrian accommodations, and inadequate roadway geometrics. The existing shoulders are unpaved and variable in width, providing no safe accommodations for pedestrian and bicycle traffic.

Project Description: The applicant proposes to reconstruct approximately 5.5 miles of CSAH 4, widening the existing 30-foot two lane rural roadway to 34 feet. The project will also correct minor vertical deficiencies and replace existing drainage structures. In-slopes would be graded as steep as permissible to minimize impacts in wetland areas.

Name, Area and Types of waters (including wetlands) subject to loss: The project would result in a total of 3.63 acres of wetland impacts in 40 locations due to permanent fill (1.78 acres) and temporary fill (1.85 acres). The temporary fill is associated with grading and temporary storage of topsoil along the outer portion of the construction corridor during construction. The project would have 1.78 acres of permanent wetland impacts from fill including: 1.21 acres of sedge meadow, 0.13 acres of deep marsh, 0.23 acres of shrub swamp, 0.16 acres of shallow marsh, and 0.05 acres of coniferous swamp.

Alternatives considered:
The applicant considered a "do-nothing" alternative, which would not correct deficiencies and would result in increased maintenance costs. This alternative was deemed inappropriate because it would not address safety concerns or accommodate future traffic volume.

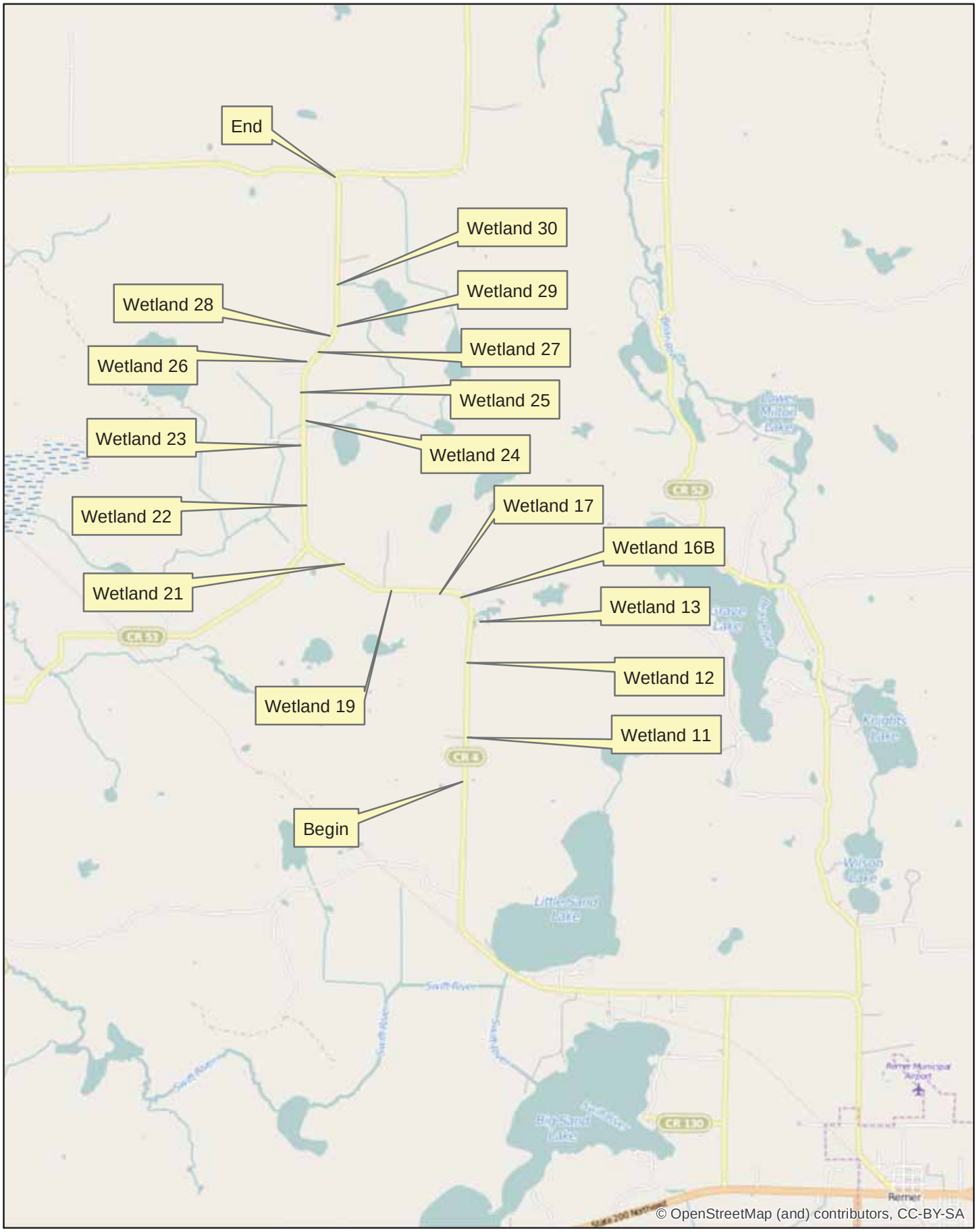
The applicant considered overlaying the existing pavement, which was deemed not feasible. This alternative would correct pavement deficiencies and avoid wetland impacts, but would not address roadway geometrics which are currently not meeting design standards.

The applicant considered an alternative alignment and corridor, involving reconstruction of the roadway. This alternative was dismissed because of the residential and land use impacts, natural resource impacts to wetlands and forests, the substantial right-of-way and relocation impacts, and substantial costs of construction.

COMPENSATORY MITIGATION: The project impacts are located in Bank Service Area 5. The applicant has proposed to compensate for 1.78 acres of permanent wetland impacts by debiting credits from the Minnesota Local Government Road Wetland Replacement Program mitigation bank.

Drawings See attached.

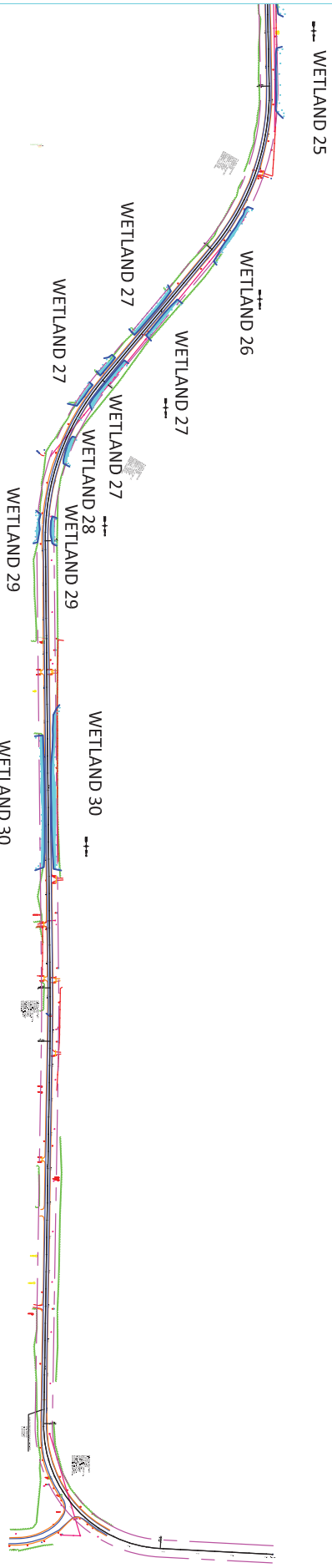
2014-03693-WAB Cass County CSAH 4 location map



0 0.75 1.5 3 Miles

WETLAND 11
WETLAND 12
WETLAND 13
WETLAND 14
WETLAND 15
WETLAND 16A
WETLAND 16B
WETLAND 17
WETLAND 18
WETLAND 19
WETLAND 19
WETLAND 19

WETLAND 19
WETLAND 19
WETLAND 20
WETLAND 21
WETLAND 21
WETLAND 21
WETLAND 21
WETLAND 22
WETLAND 22
WETLAND 23
WETLAND 24
WETLAND 24
WETLAND 25
WETLAND 25


WETLAND 25
WETLAND 26
WETLAND 27
WETLAND 27
WETLAND 27
WETLAND 28
WETLAND 29
WETLAND 29
WETLAND 30
WETLAND 30

AQUATIC RESOURCE IMPACT SUMMARY

AQUATIC IMPACT SUMMARY - CHOSEN ALTERNATIVE

ID of Wetland Basin Impacted	Aquatic Resource Type	Type of Impact	Duration of Impact (Perm. or Temp.)	Size of Wetland Impact (AC)	Size of Aquatic Resource (AC)	Existing Plant Community Types	County, Major Watershed #, and Bank Service Area #
11	Wetland	Fill	P	0.10	60.95	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
11	Wetland	Fill	T	0.47	60.95	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
12	Wetland	Fill	P	0.01	10.86	Sedge Meadow/ Shrub Swamp	Cass; Leech Lake River (8); BSA 5
12	Wetland	Fill	T	0.02	10.86	Sedge Meadow/ Shrub Swamp	Cass; Leech Lake River (8); BSA 5
13	Wetland	Fill	P	165.60 SF	11.99	Deep Marsh	Cass; Leech Lake River (8); BSA 5
13	Wetland	Fill	T	0.03	11.99	Deep Marsh	Cass; Leech Lake River (8); BSA 5
14	Wetland	Fill	P	No Impacts	Unknown	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
14	Wetland	Fill	T	No Impacts	Unknown	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
15	Wetland	Fill	P	No Impacts	4.92	Shrub Swamp	Cass; Leech Lake River (8); BSA 5
15	Wetland	Fill	T	No Impacts	4.92	Shrub Swamp	Cass; Leech Lake River (8); BSA 5
16	Wetland	Fill	P	0.01	Unknown	Shallow Marsh/ Forested, Temporarily Flooded	Cass; Leech Lake River (8); BSA 5
16	Wetland	Fill	T	0.01	Unknown	Shallow Marsh/ Forested, Temporarily Flooded	Cass; Leech Lake River (8); BSA 5
17	Wetland	Fill	P	0.03	11.15	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
17	Wetland	Fill	T	0.03	11.15	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
18	Wetland	Fill	P	No Impacts	6.19	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
18	Wetland	Fill	T	No Impacts	6.19	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
19	Wetland	Fill	P	0.04	13.09	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
19	Wetland	Fill	T	0.14	13.09	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
20	Wetland	Fill	P	No Impacts	Unknown	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
20	Wetland	Fill	T	No Impacts	Unknown	Sedge Meadow	Cass; Leech Lake River (8); BSA 5

AQUATIC RESOURCE IMPACT SUMMARY

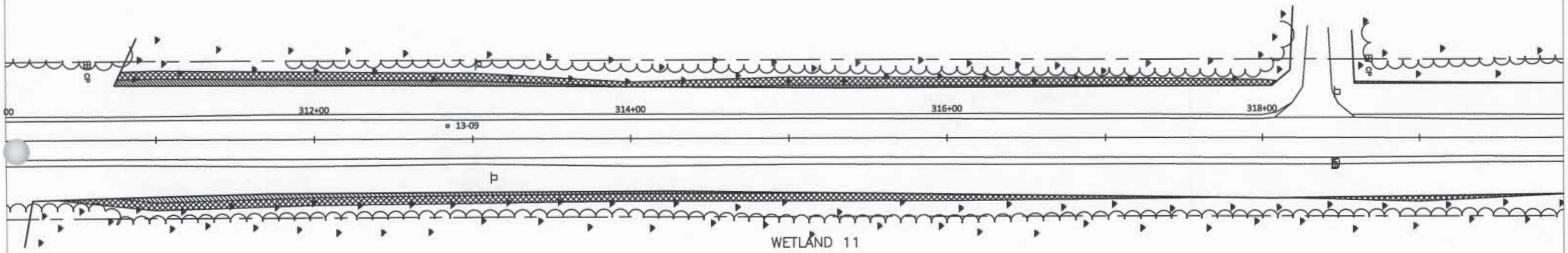
AQUATIC IMPACT SUMMARY - CHOSEN ALTERNATIVE

ID of Wetland Basin Impacted	Aquatic Resource Type	Type of Impact	Duration of Impact (Perm. Or Temp.)	Size of Wetland Impact (AC)	Size of Aquatic Resource (AC)	Existing Plant Community Types	County, Major Watershed #, and Bank Service Area #
21	Wetland	Fill	P	0.23	116.26	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
21	Wetland	Fill	T	0.36	116.26	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
22	Wetland	Fill	P	0.13	Unknown	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
22	Wetland	Fill	T	0.11	Unknown	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
23	Wetland	Fill	P	98.58 SF	0.24	Shallow Marsh	Cass; Leech Lake River (8); BSA 5
23	Wetland	Fill	T	0.01	0.24	Shallow Marsh	Cass; Leech Lake River (8); BSA 5
24	Wetland	Fill	P	0.30	16.24	Shallow Marsh (E)/ Shrub Swamp (W)	Cass; Leech Lake River (8); BSA 5
24	Wetland	Fill	T	0.17	16.24	Shallow Marsh (E)/ Shrub Swamp (W)	Cass; Leech Lake River (8); BSA 5
25	Wetland	Fill	P	0.06	Unknown	Sedge Meadow/ Shrub Swamp	Cass; Leech Lake River (8); BSA 5
25	Wetland	Fill	T	0.07	Unknown	Sedge Meadow/ Shrub Swamp	Cass; Leech Lake River (8); BSA 5
26	Wetland	Fill	P	0.06	Unknown	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
26	Wetland	Fill	T	0.04	Unknown	Sedge Meadow	Cass; Leech Lake River (8); BSA 5
27	Wetland	Fill	P	0.25	Unknown	Deep Marsh (N)/ Sedge Meadown (S)	Cass; Leech Lake River (8); BSA 5
27	Wetland	Fill	T	0.14	Unknown	Deep Marsh (N)/ Sedge Meadown (S)	Cass; Leech Lake River (8); BSA 5
28	Wetland	Fill	P	0.05	0.53	Shrub Swamp	Cass; Leech Lake River (8); BSA 5
28	Wetland	Fill	T	0.02	0.53	Shrub Swamp	Cass; Leech Lake River (8); BSA 5
29	Wetland	Fill	P	0.05	1.07	Tamarack Bog	Cass; Leech Lake River (8); BSA 5
29	Wetland	Fill	T	0.04	1.07	Tamarack Bog	Cass; Leech Lake River (8); BSA 5
30	Wetland	Fill	P	0.45	13.89	Sedge Meadow	Cass; Leech Lake River (8); BSA 6
30	Wetland	Fill	T	0.19	13.89	Sedge Meadow	Cass; Leech Lake River (8); BSA 7

Total Impacts - Temporary and Permanent	3.63 AC
Total Impacts - Temporary	1.85 AC
Total Impacts - Permanent	1.78 AC

WETLAND 11

Permanent Impacts = 0.06 AC
Temporary Impacts = 0.24 AC



Permanent Impacts = 0.04 AC
Temporary Impacts = 0.23 AC

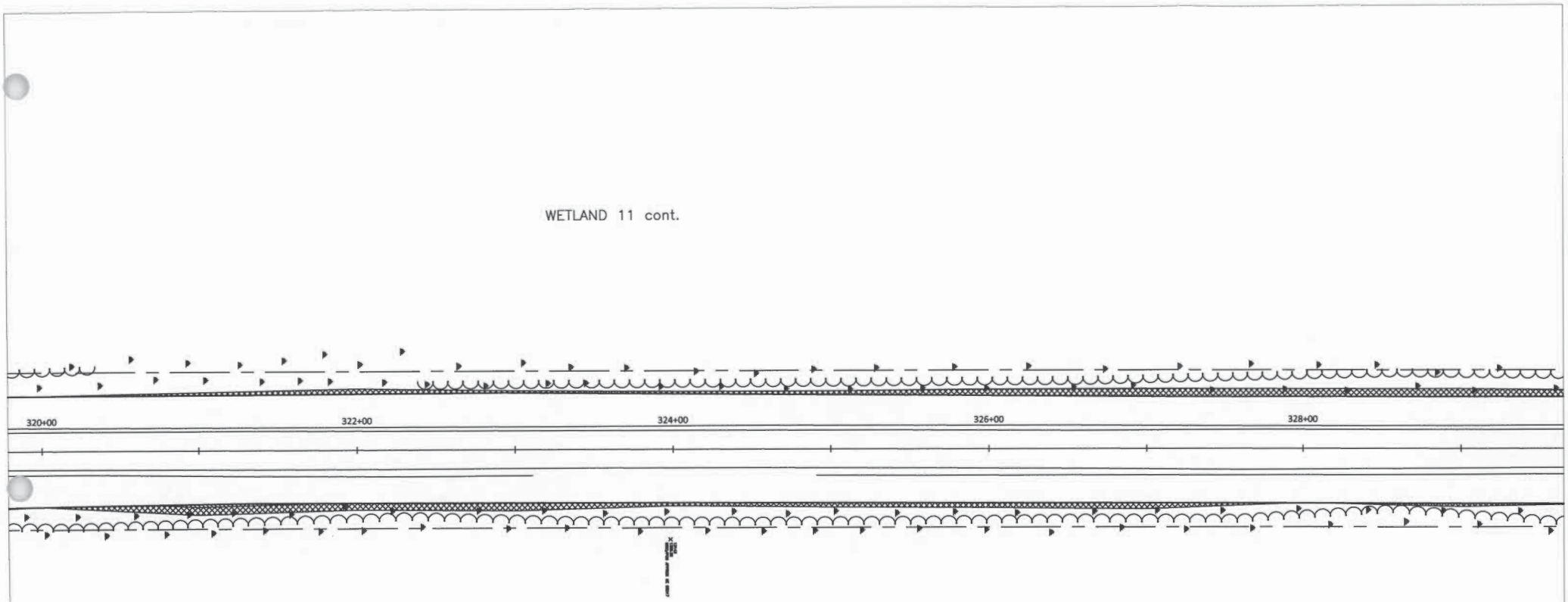
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 1 OF 21



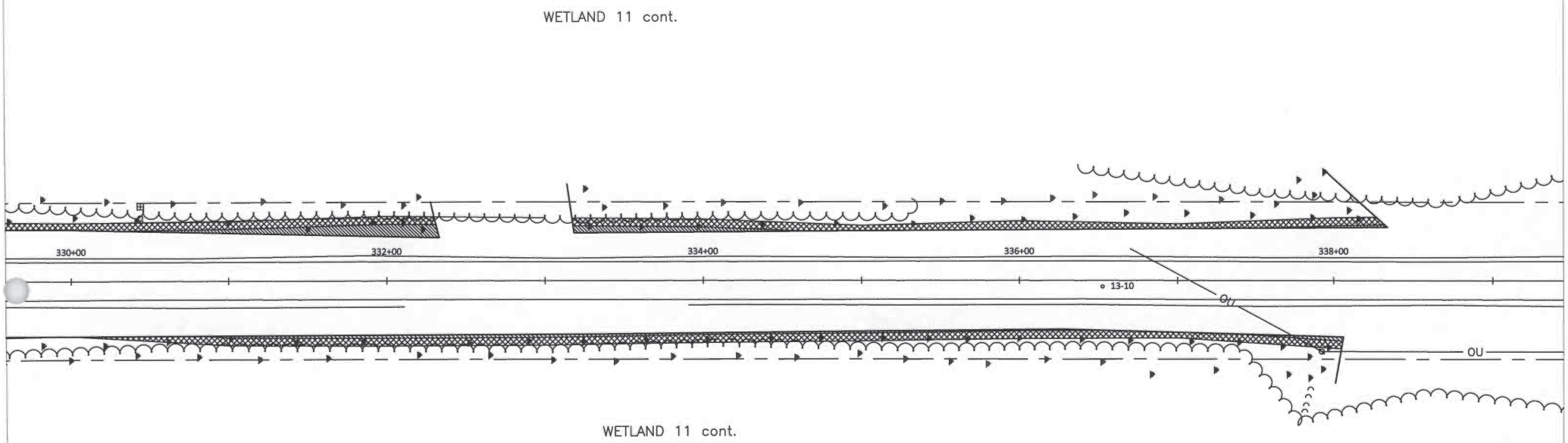
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 2 OF 21



Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

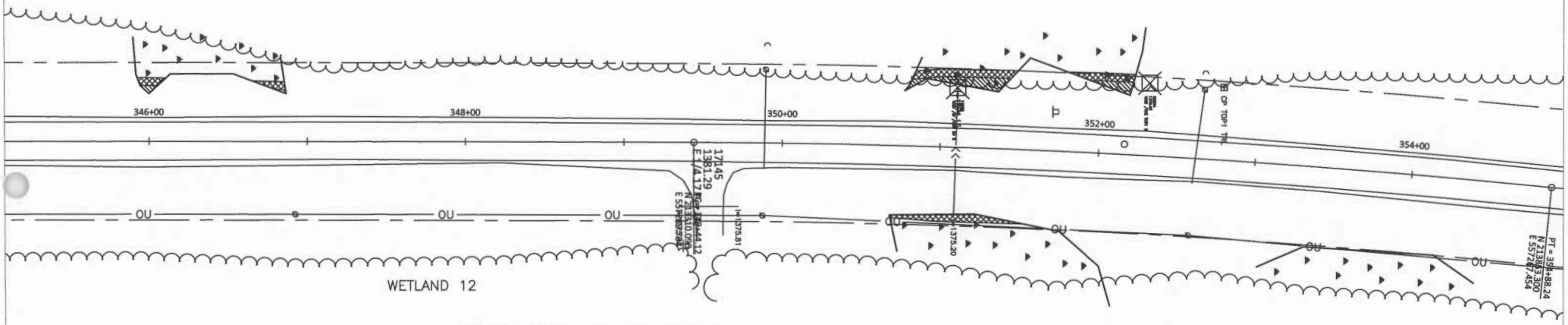
LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 3 OF 21

WETLAND 12

Permanent Impacts = 0.01 AC
Temporary Impacts = 0.01 AC



WETLAND 12

Permanent Impacts = No Impacts
Temporary Impacts = 0.01 AC

P.I. STA. 352+16.38
N 213582.352
E 557240.674
DELTA = 05° 26' 27" RT.
RADIUS = 5730.0'
LENGTH = 544.12'
D.O.C. = 1° 00' 00"
TANGENT = 272.26'
EXTERNAL = 6.46'
SUPER = 0.023'/' MAX.

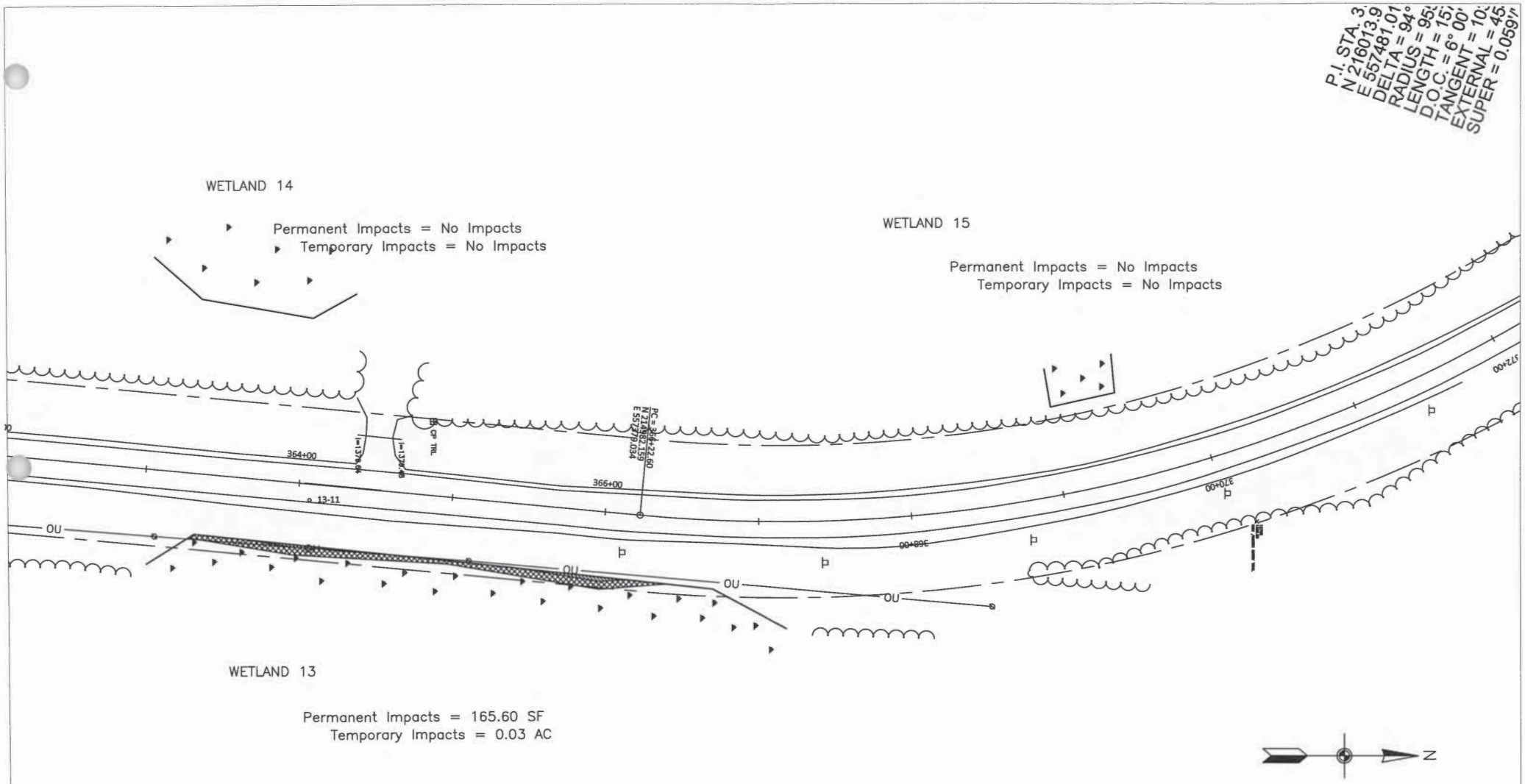
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 4 OF 21



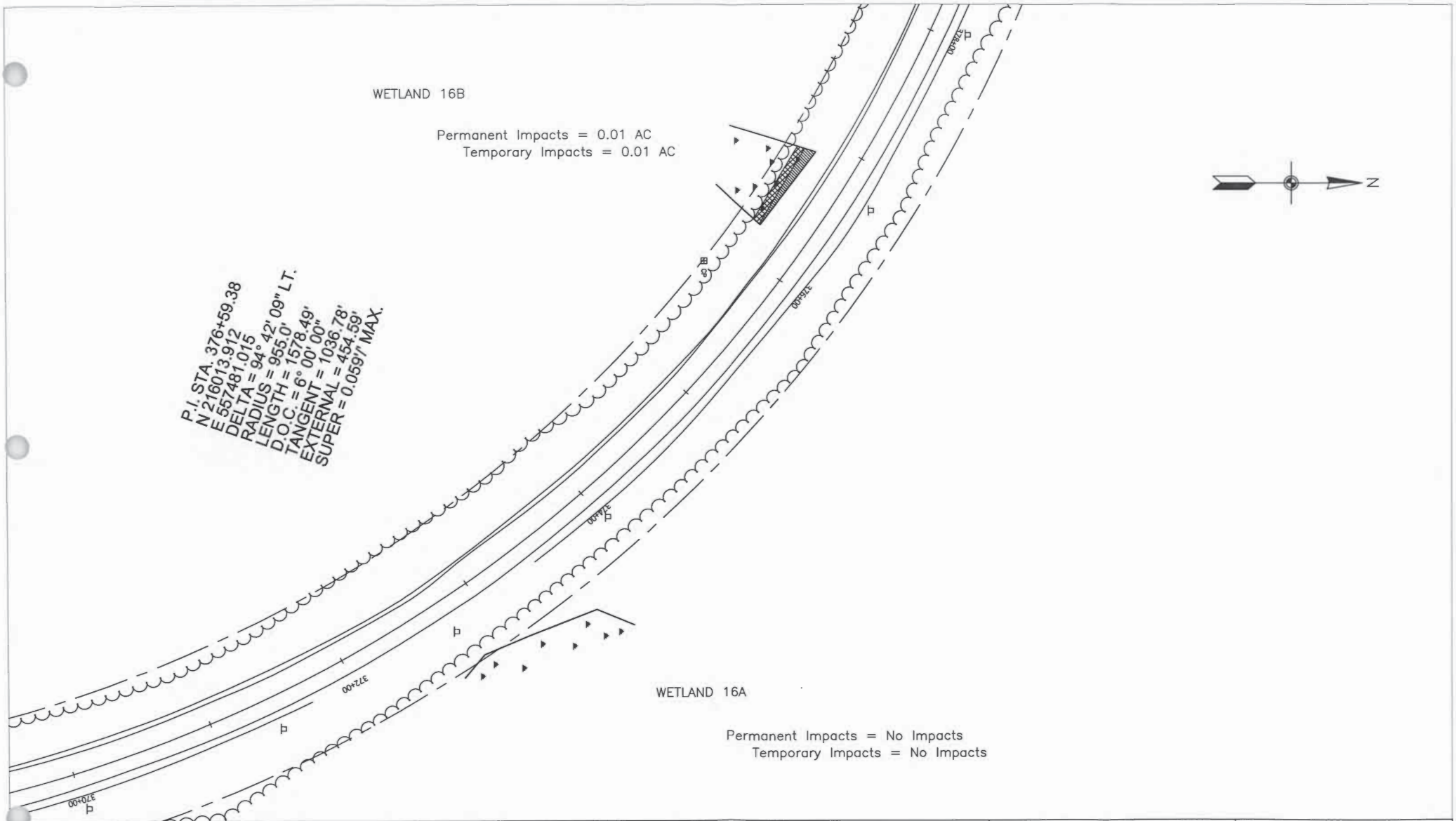
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 5 OF 21



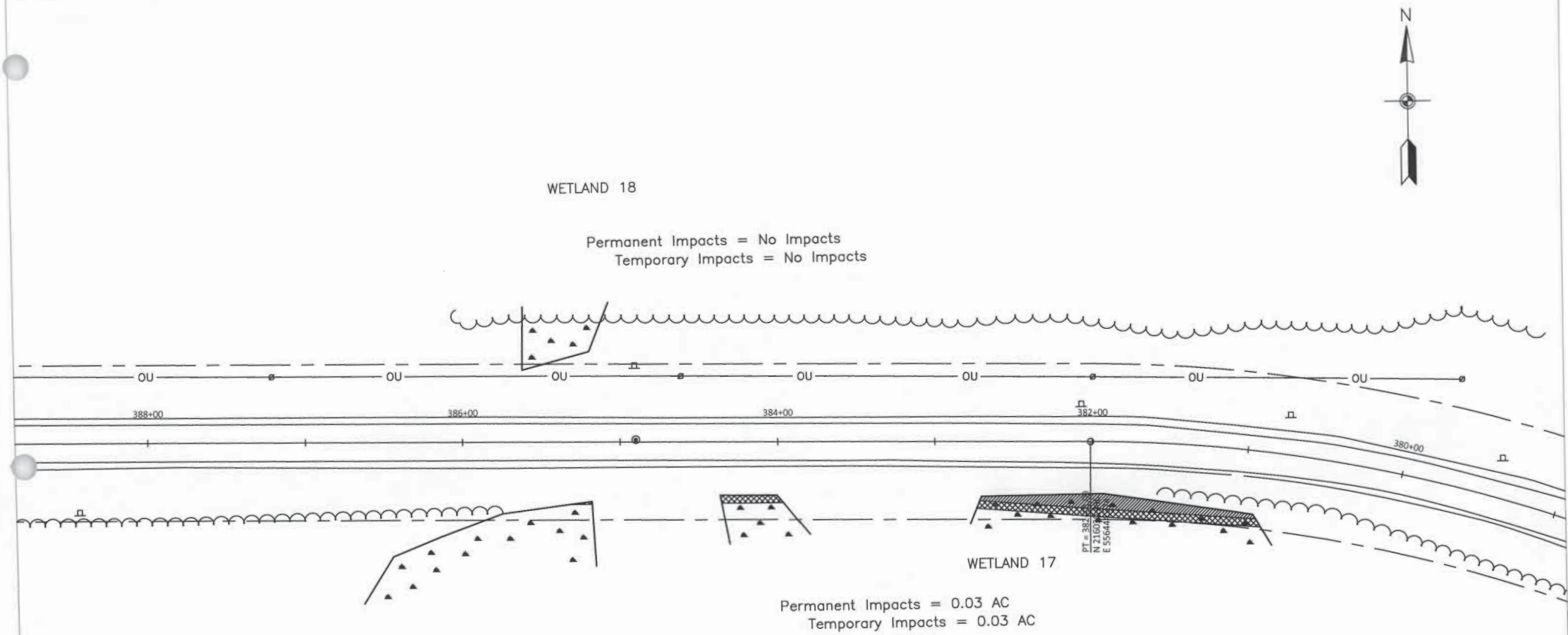
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 6 OF 21



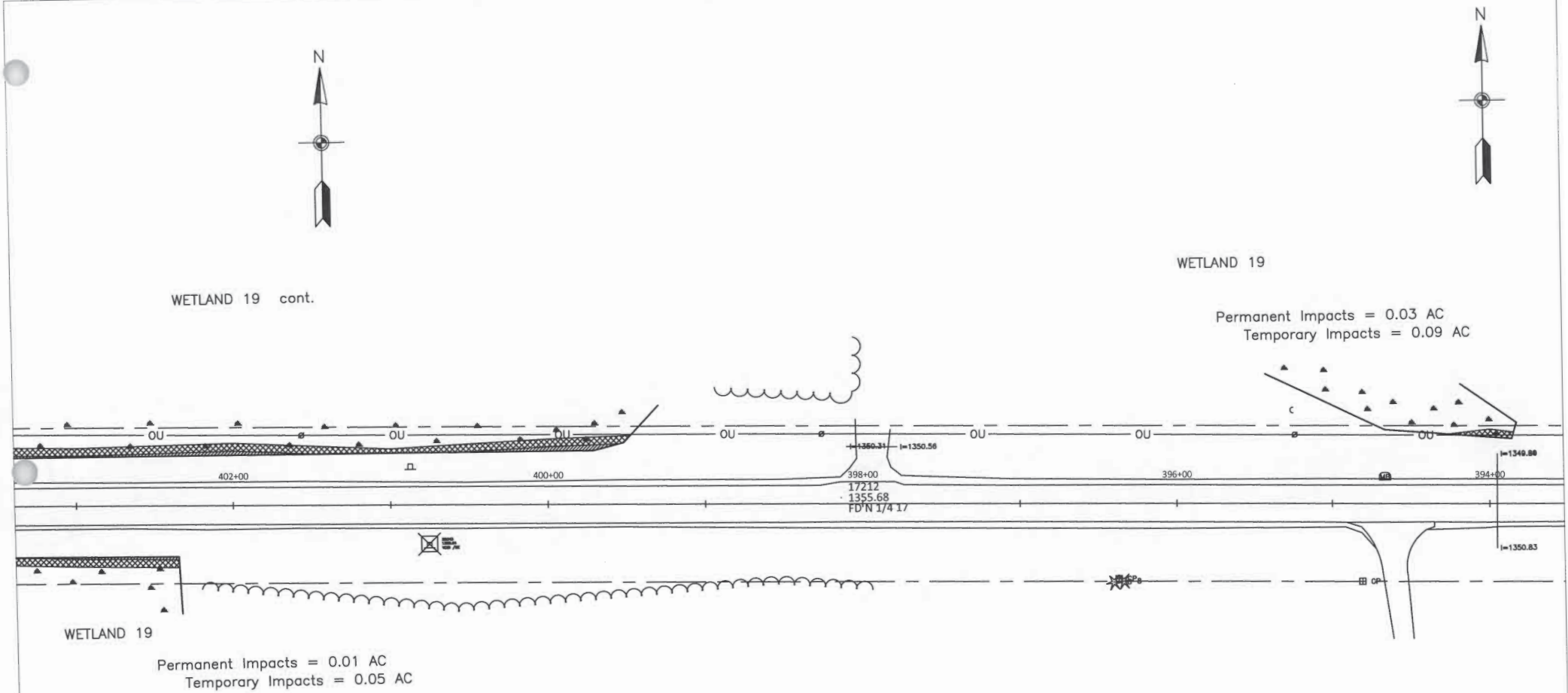
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 7 OF 21



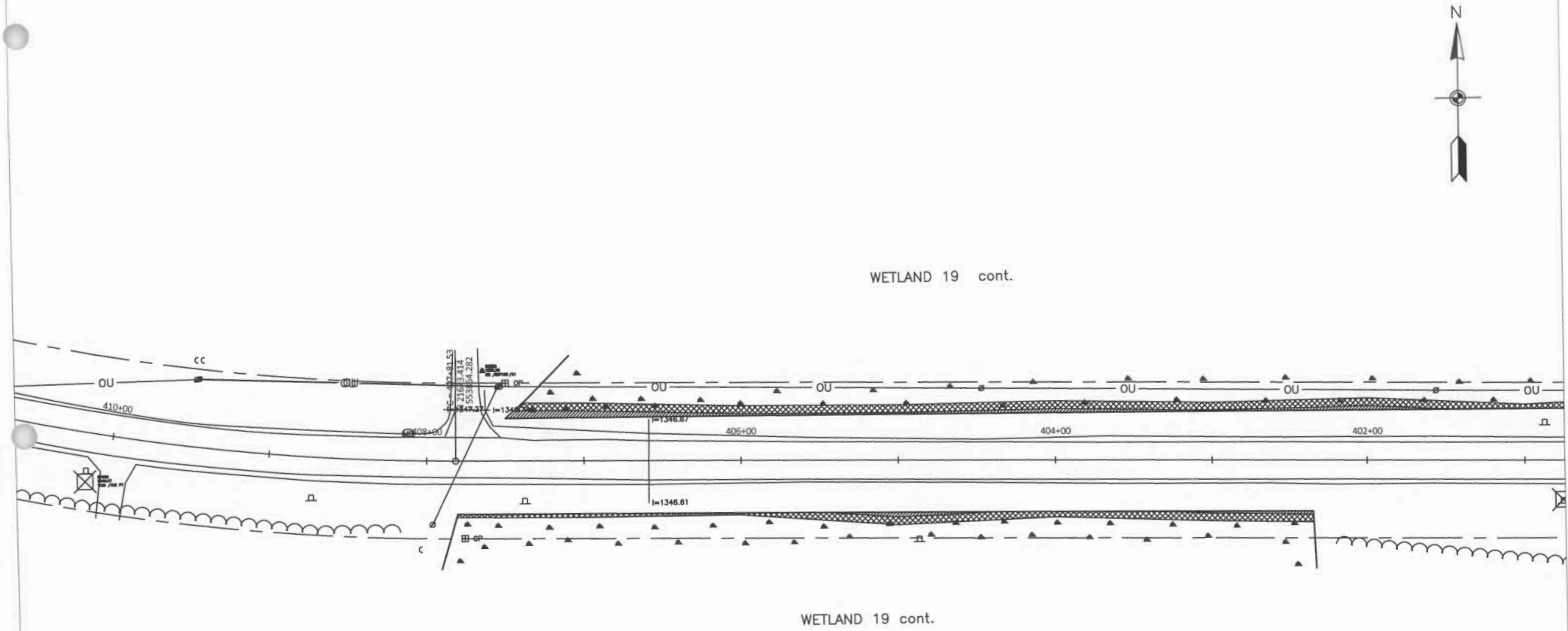
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 8 OF 21



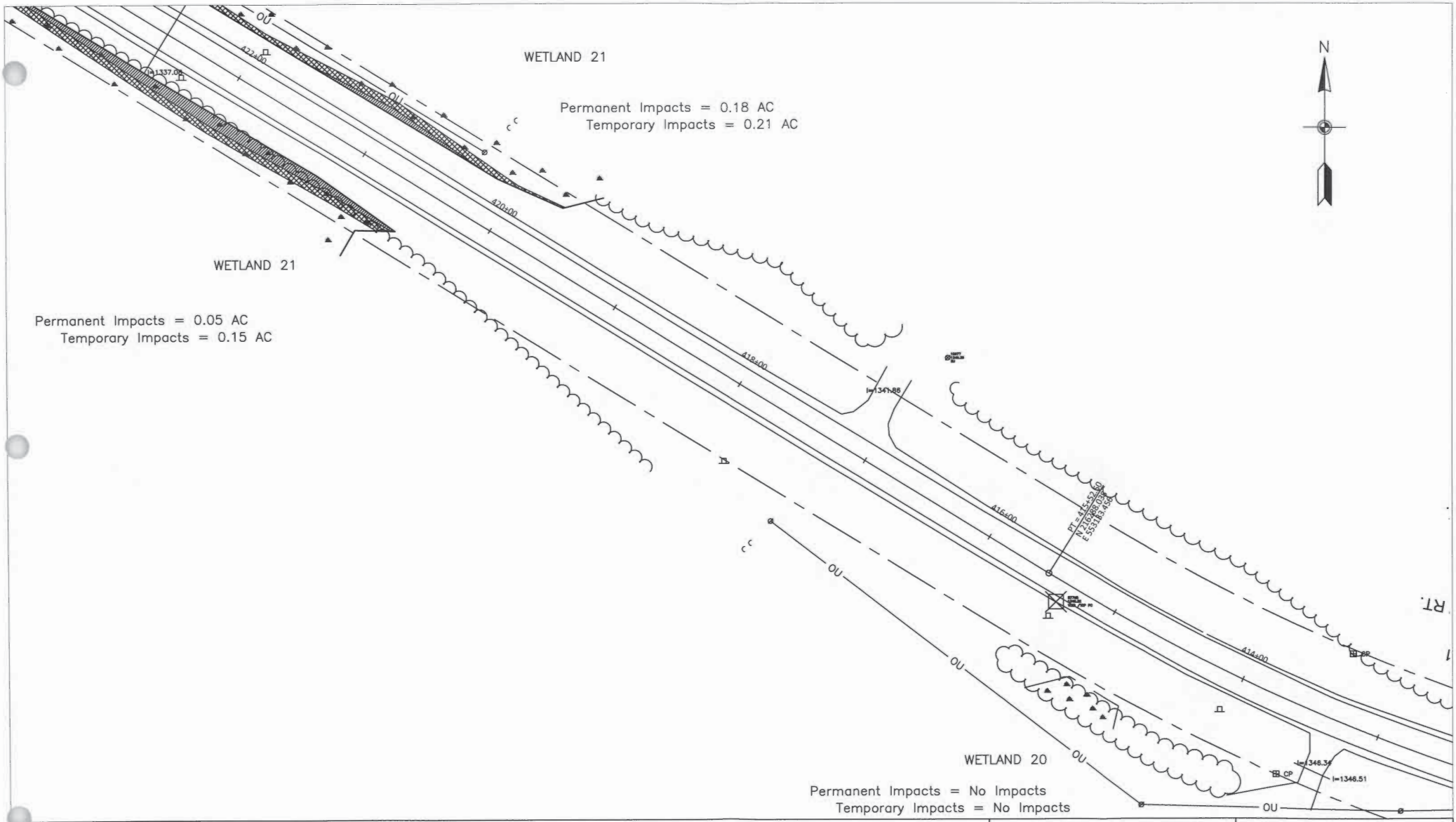
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 9 OF 21



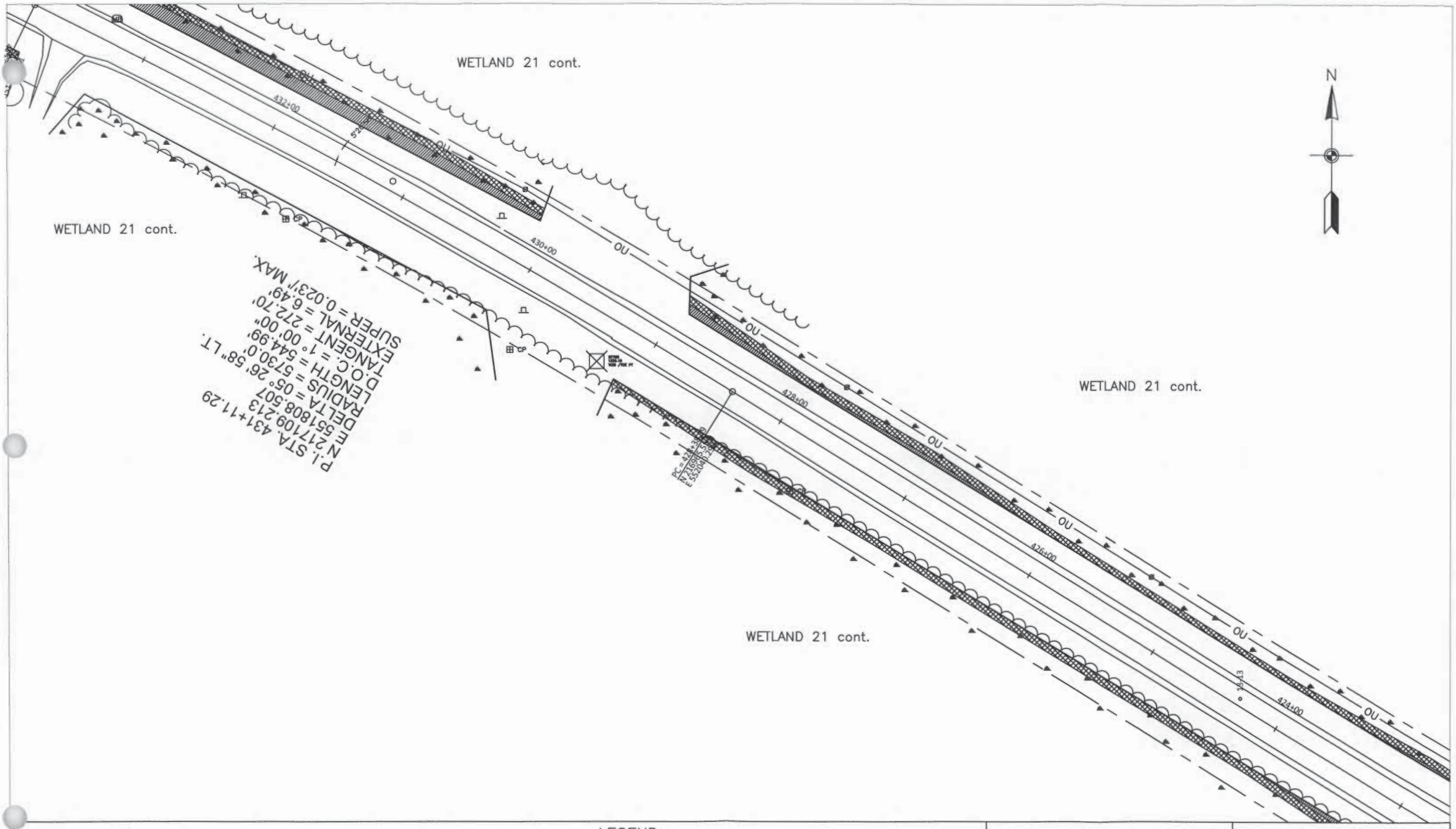
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 10 OF 21



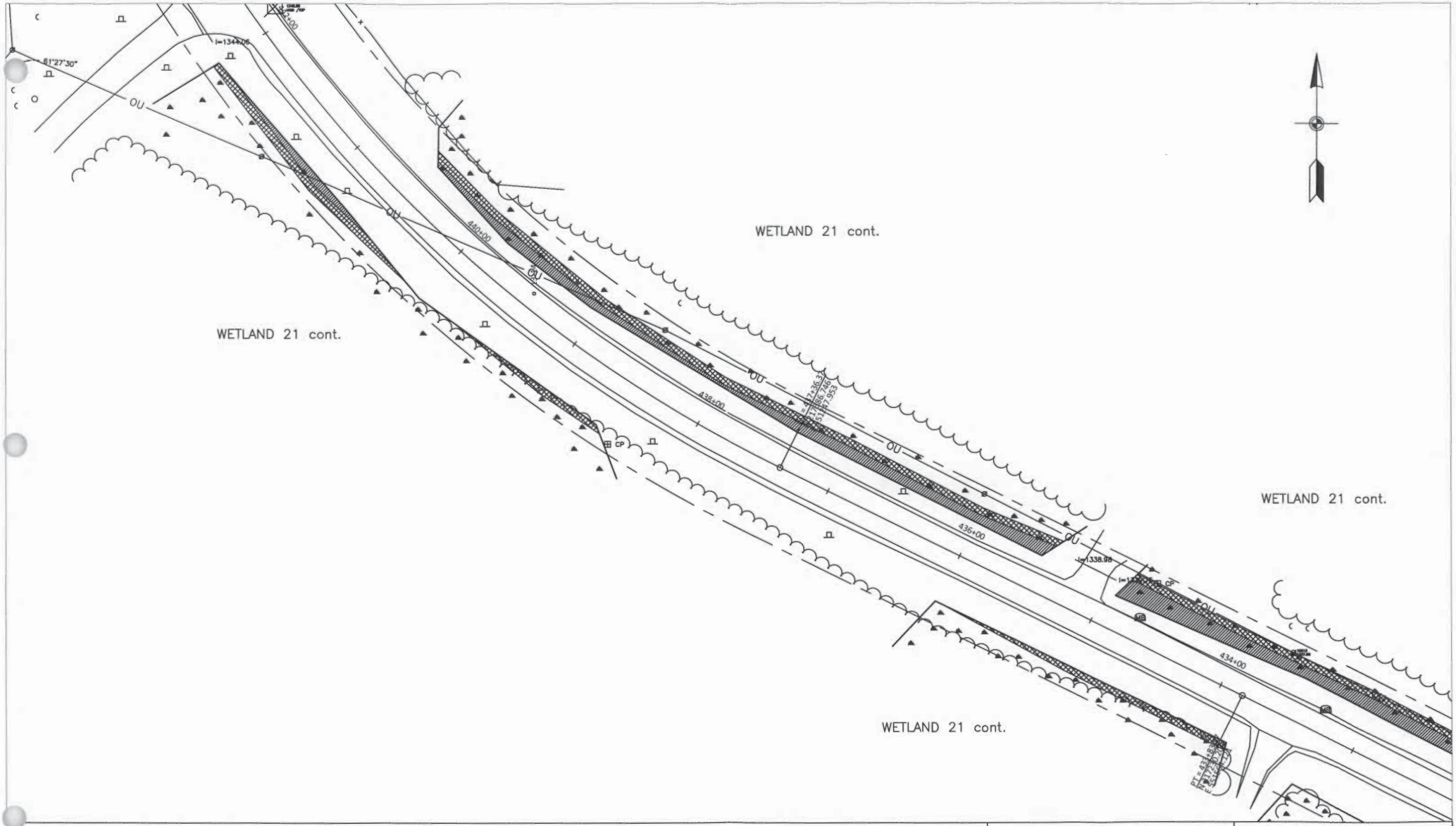
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 21 OF 21



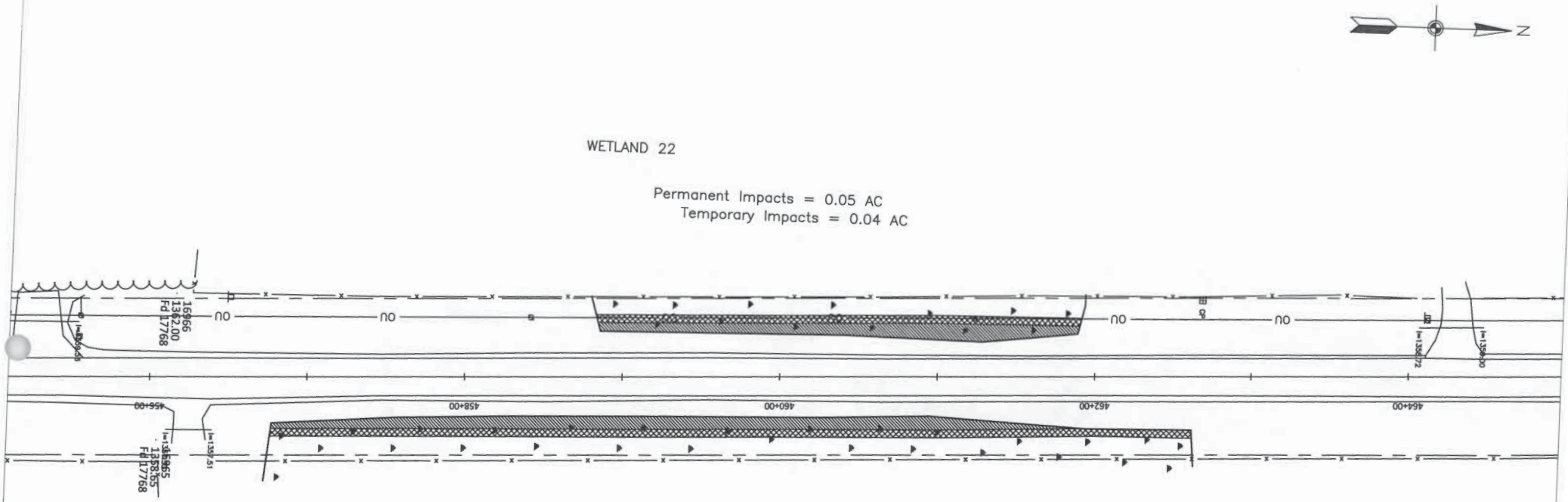
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 12 OF 21



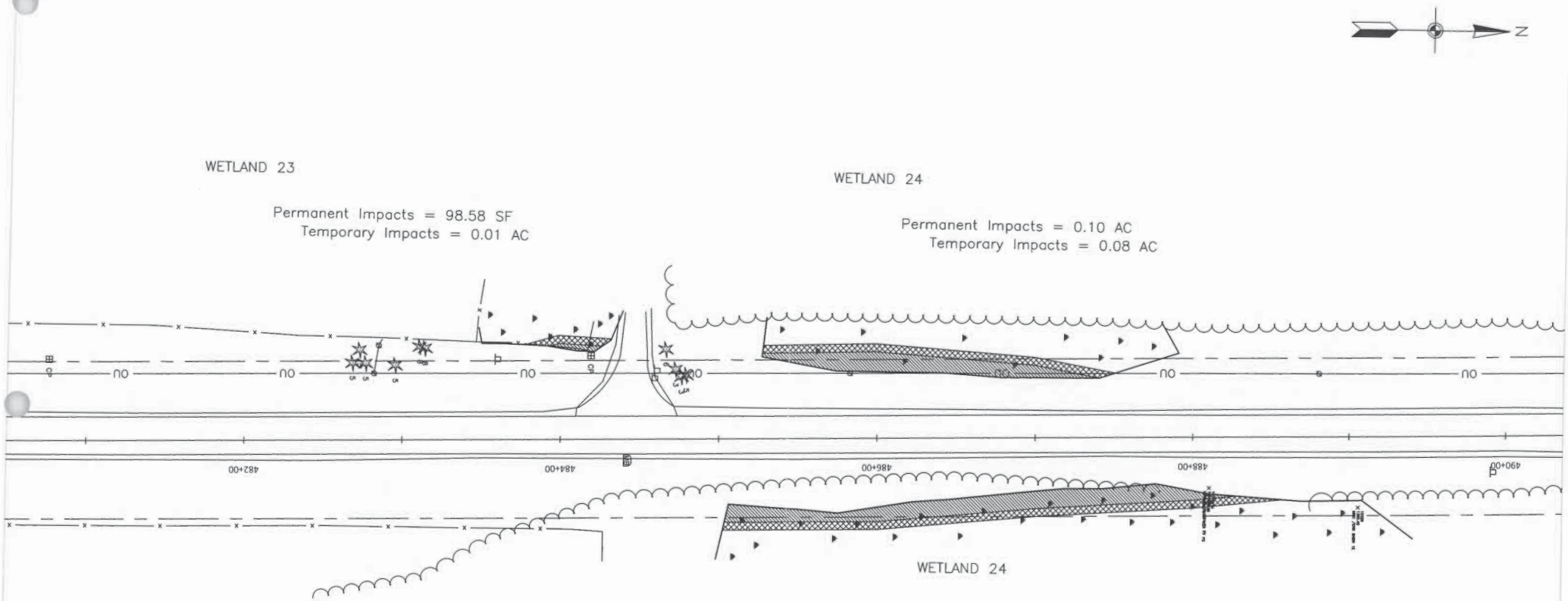
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 15 OF 21



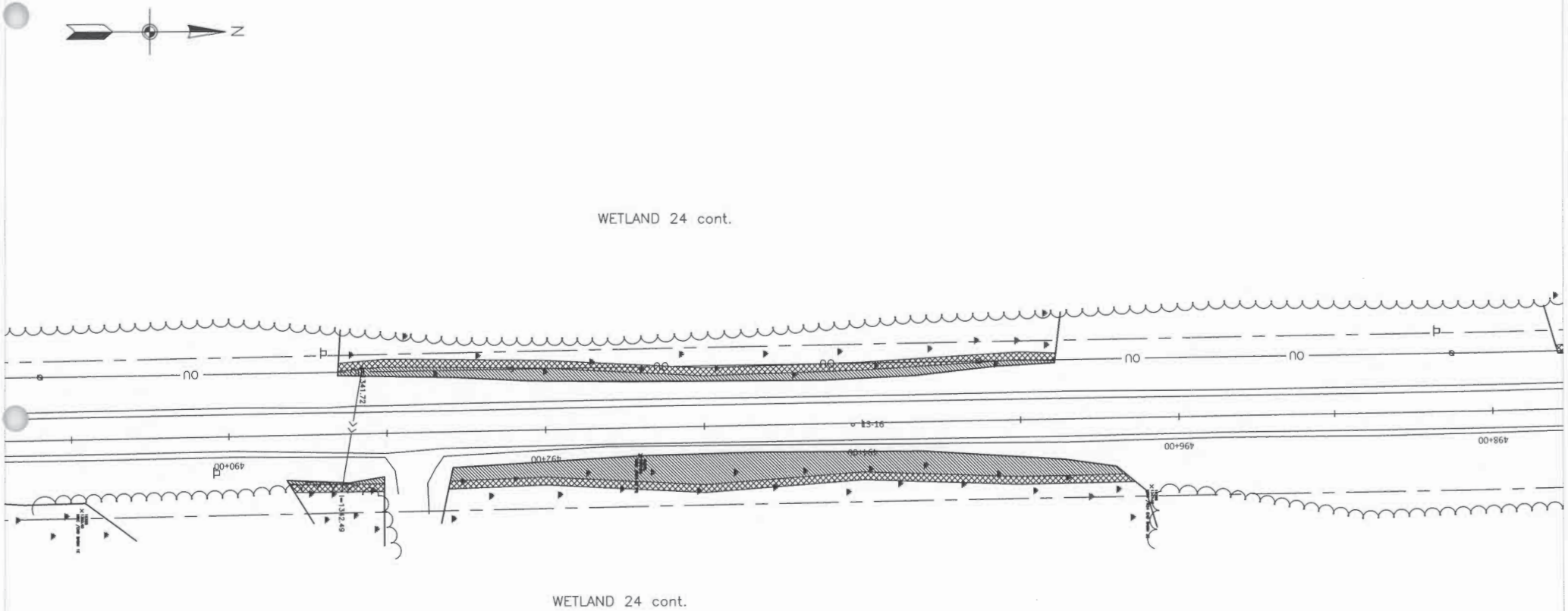
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 14 OF 21



Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

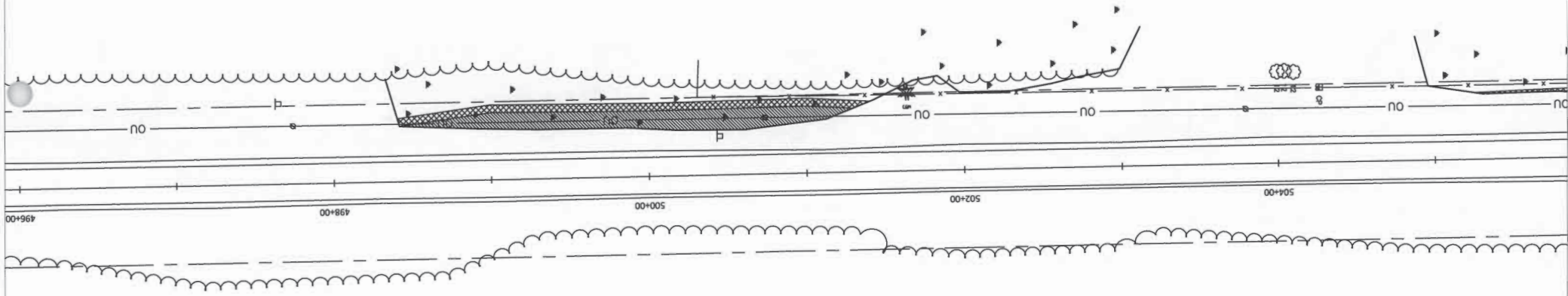
LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 17 OF 21

WETLAND 25

Permanent Impacts = 0.06 AC
Temporary Impacts = 0.07 AC



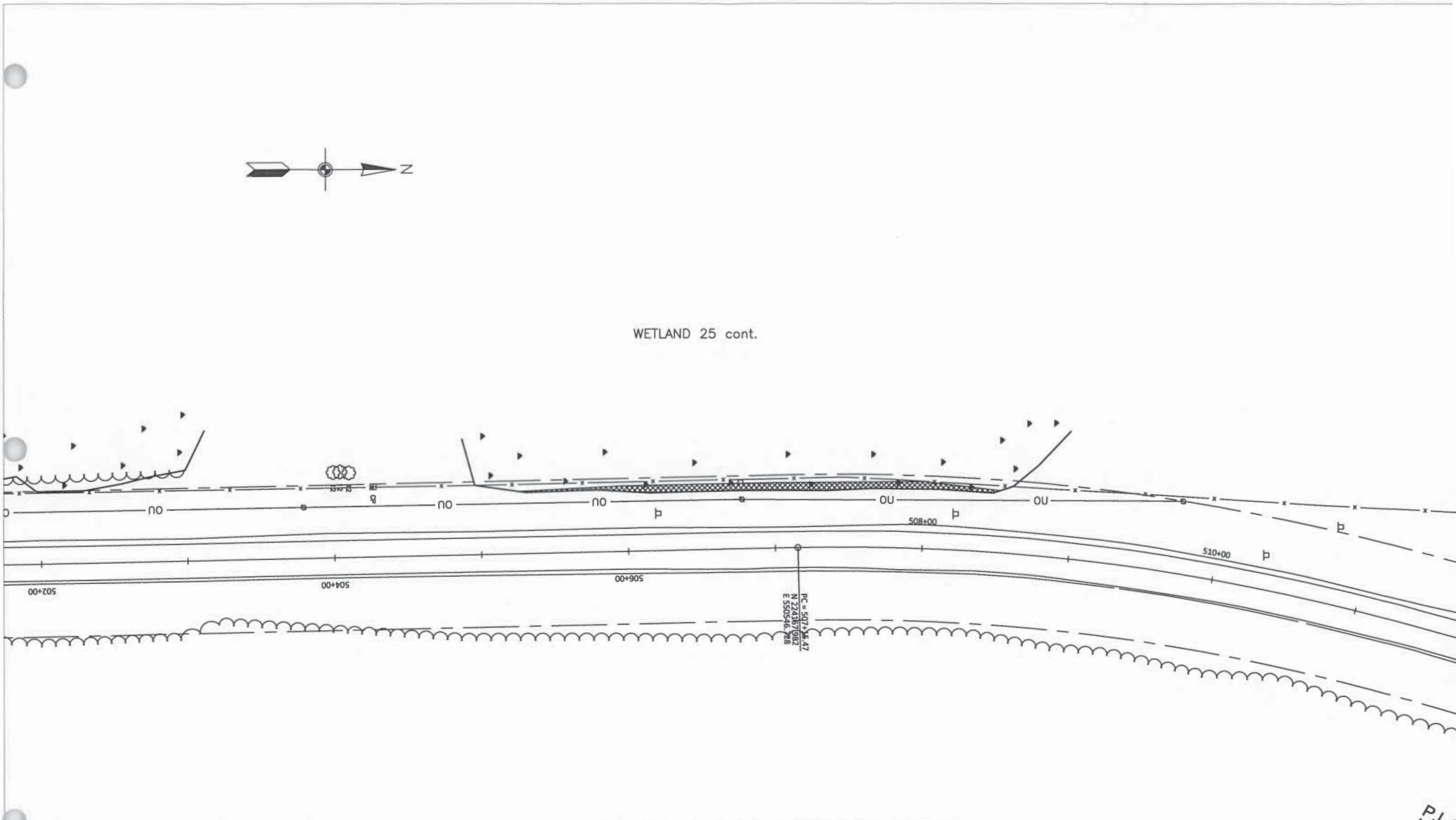
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 16 OF 21



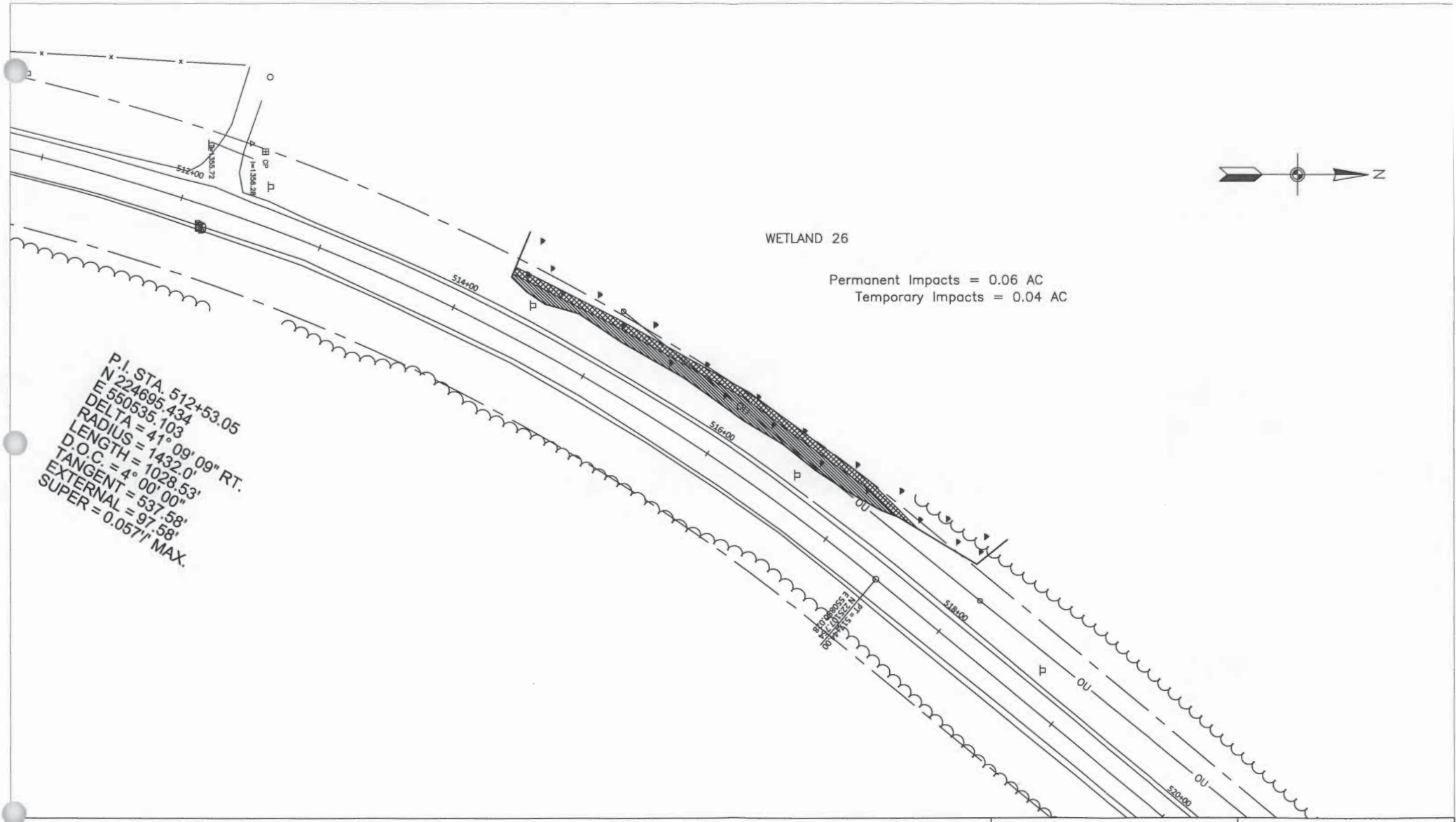
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 17 OF 21

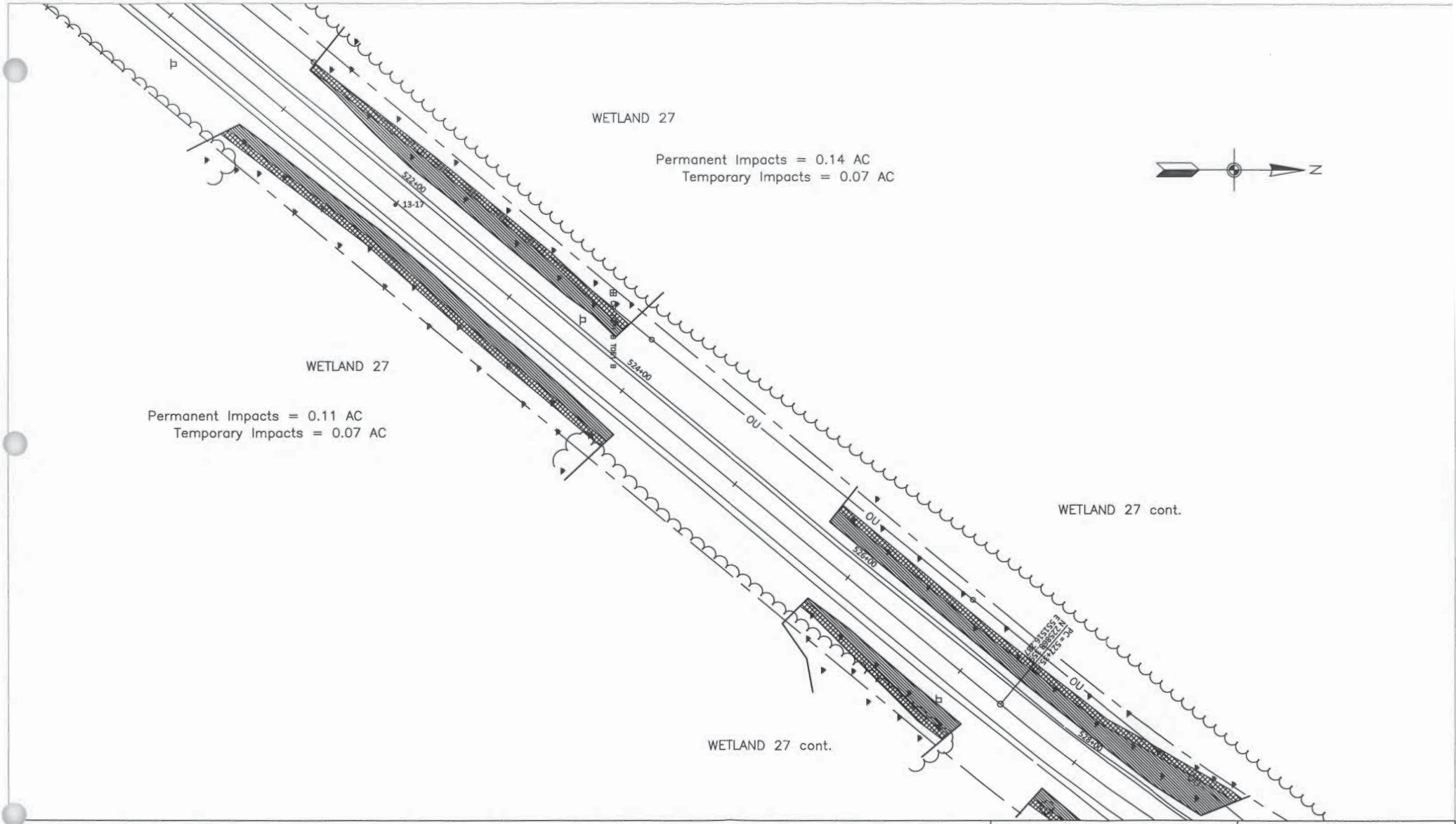


Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 18 OF 21



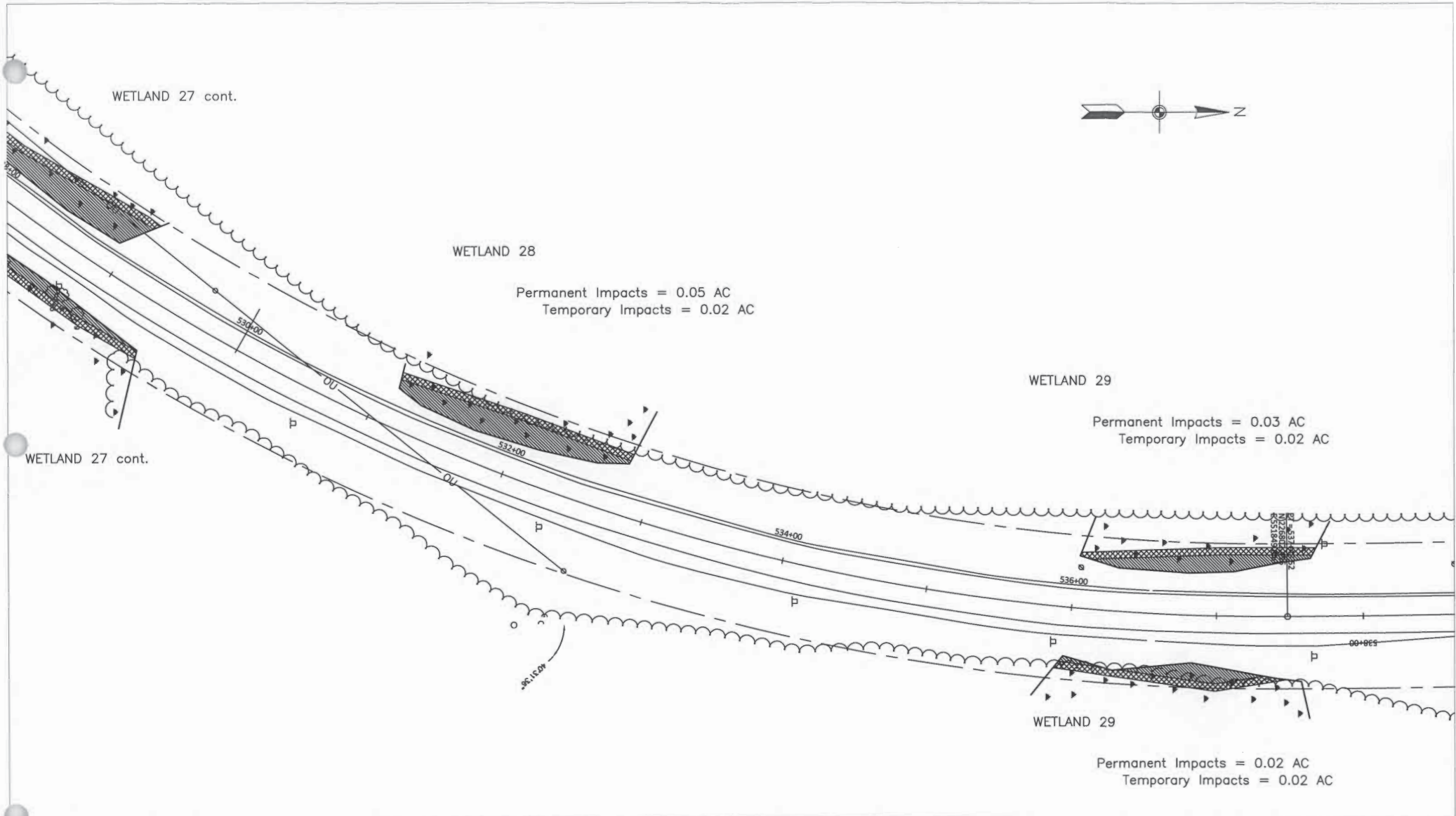
Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 19 OF 21

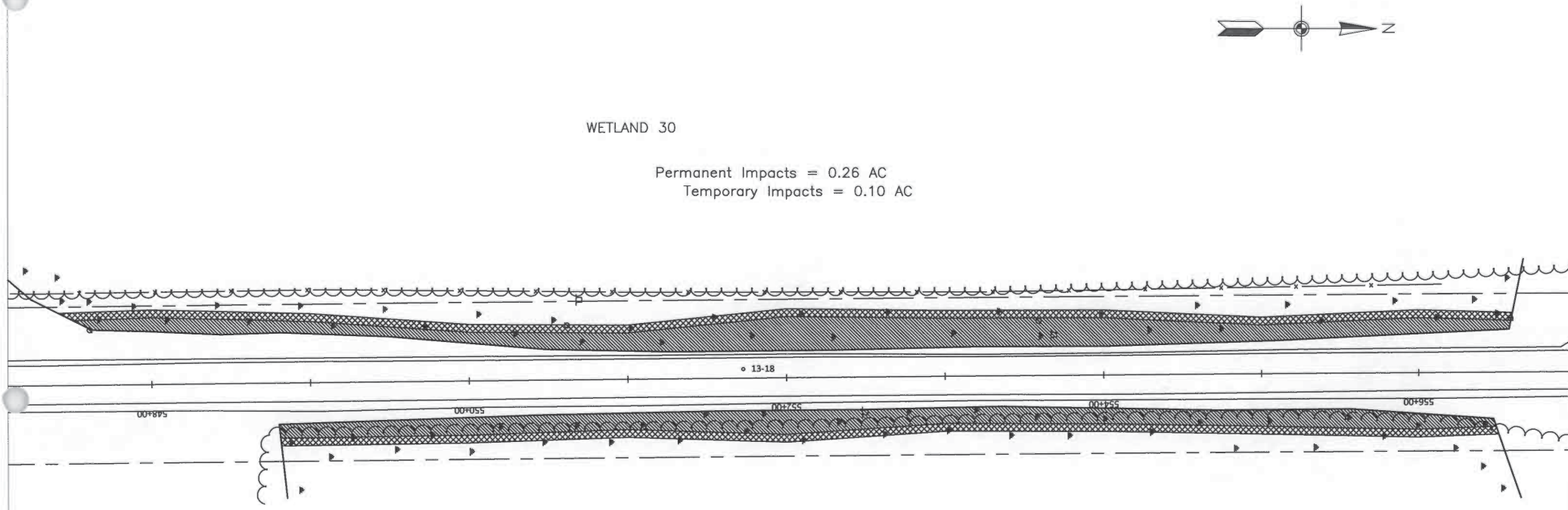


Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

LEGEND
- Wetland Delineation
- Wetland Impact (Perm)
- Wetland Impact (Temp)

S.A.P. 011-604-017

SHEET 20 OF 21



WETLAND 30

Permanent Impacts = 0.19 AC
Temporary Impacts = 0.09 AC

Wetland Impacts
County State Aid Highway 4
Cass County, Minnesota

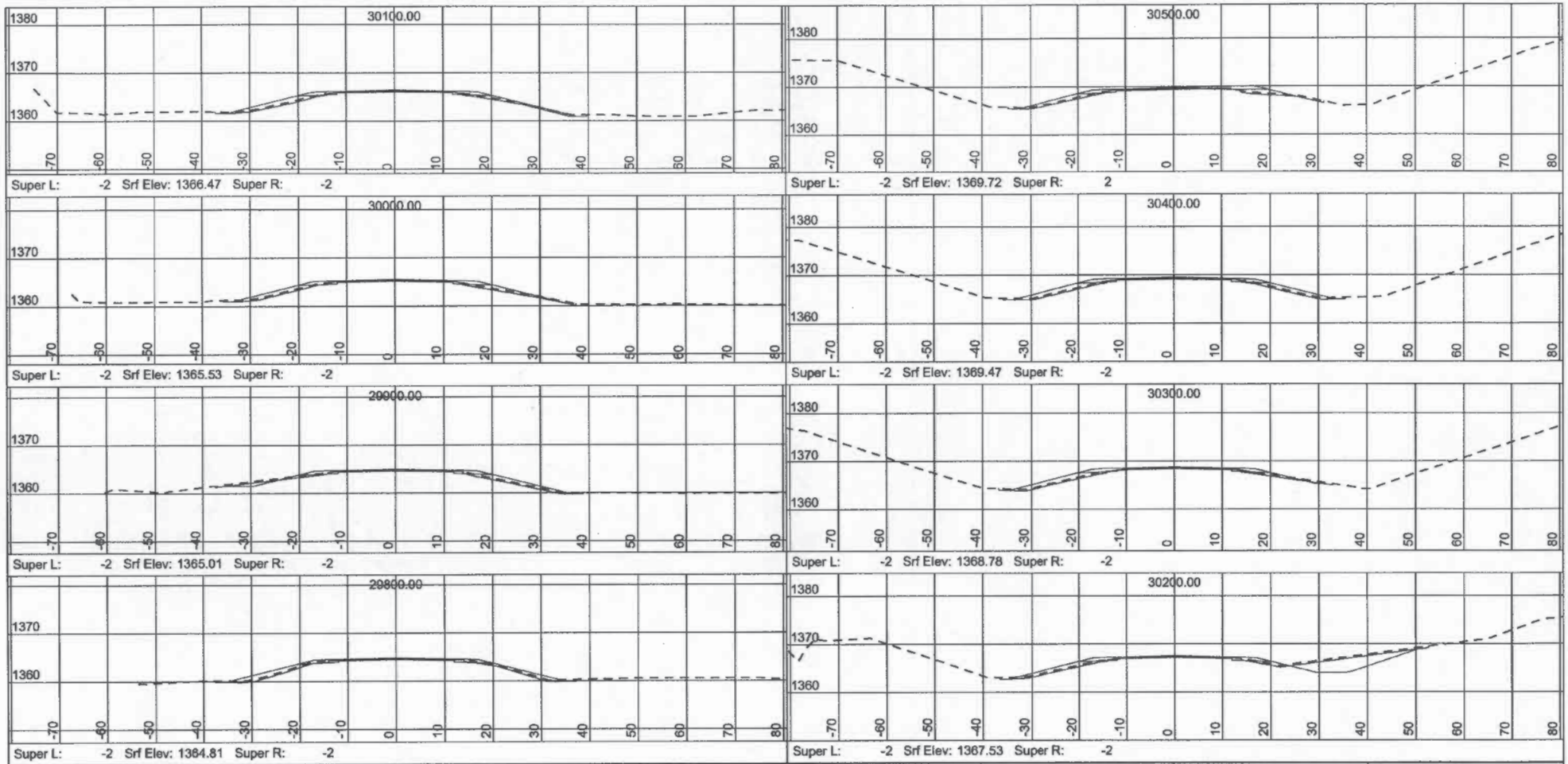
0 50' 100'

LEGEND
Wetland Delineation
Wetland Impact (Perm)
Wetland Impact (Temp)

S.A.P. 011-604-017

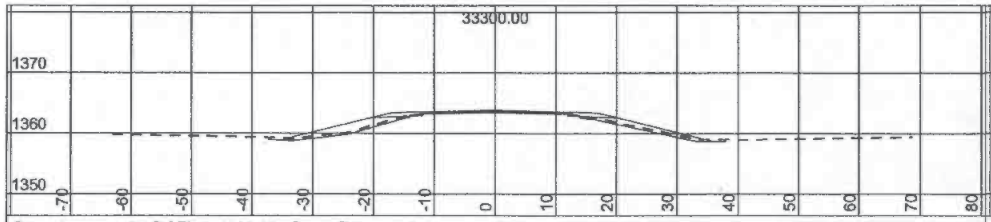
SHEET 21 OF 21

Typical cross-section drawings

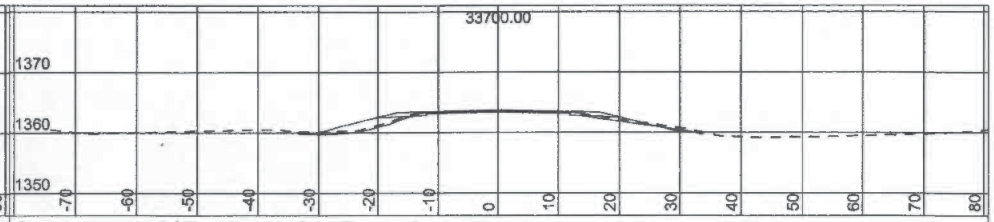


L-Stn ft.	Cut A. Sq. ft.	Fill A. Sq. ft.	Strip A. Sq. ft.	SG Cut V. Cu. Yd.	SG Fill V. Cu. Yd.	Strip V. Cu. Yd.	Mass H. Cu. Yd.
29800.00	2	36	15	14	112	58	0
29900.00	6	24	16	13	105	57	-98
30000.00	1	32	15	5	128	57	-190
30100.00	1	37	16	86	115	67	-313
30200.00	45	26	20	86	106	63	-342
30300.00	1	32	14	5	135	52	-362
30400.00	1	41	14	5	139	51	-492
30500.00	1	30	12	4	114	48	-626
30600.00							
Pg. Tot.				218	954	454	
Cum. Tot.				218	954	454	

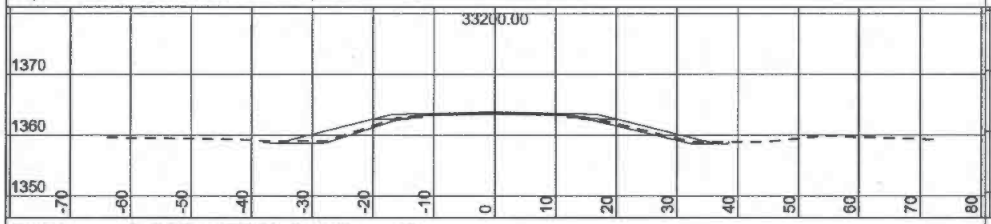
CROSS SECTIONS	STA.	29800.00	TO	STA.	30550.00	PROJECT NO. S.A.P. 011-604-017	Page 1 of 37



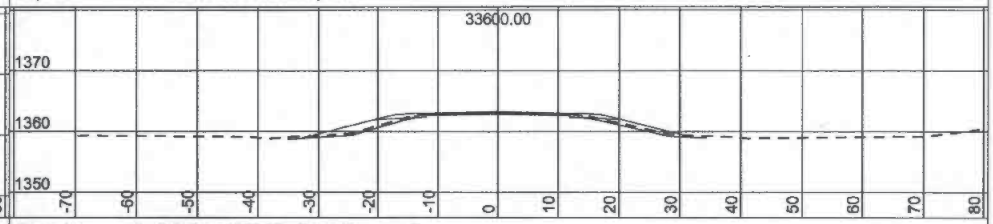
Super L: -2 Srf Elev: 1363.85 Super R: -2



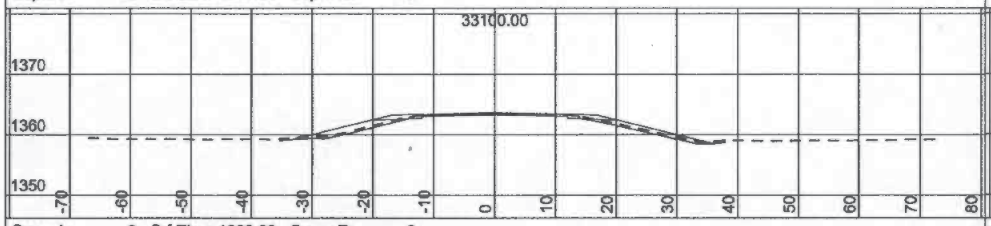
Super L: -2 Srf Elev: 1363.74 Super R: -2



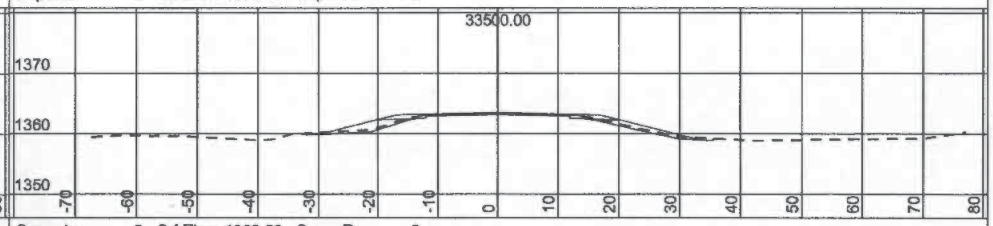
Super L: -2 Srf Elev: 1363.81 Super R: -2



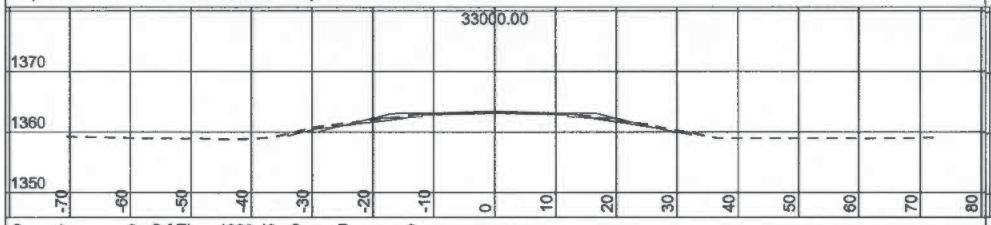
Super L: -2 Srf Elev: 1363.27 Super R: -2



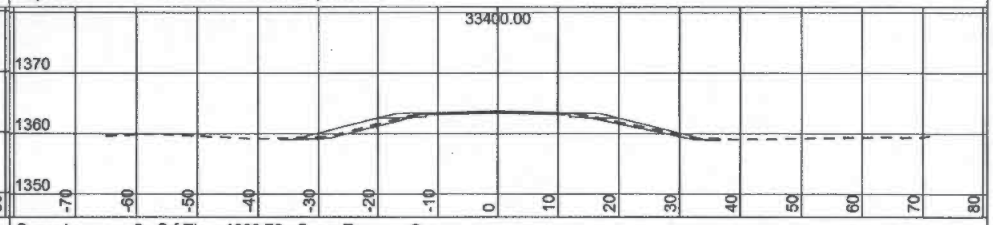
Super L: -2 Srf Elev: 1363.63 Super R: -2



Super L: -2 Srf Elev: 1363.53 Super R: -2



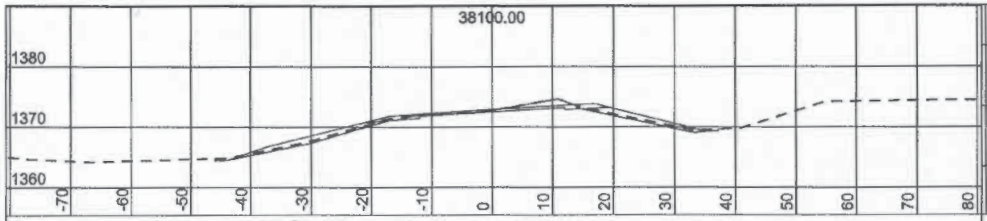
Super L: -2 Srf Elev: 1363.42 Super R: -2



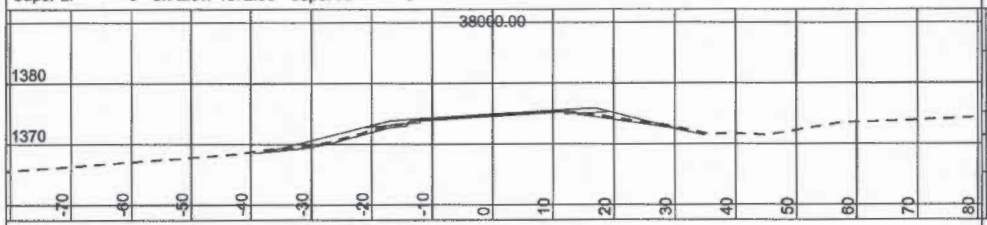
Super L: -2 Srf Elev: 1363.78 Super R: -2

L-Stn ft.	Cut A. Sq. ft.	Fill A. Sq. ft.	Strip A. Sq. ft.	SG Cut V. Cu. Yd.	SG Fill V. Cu. Yd.	Strip V. Cu. Yd.	Mass H. Cu. Yd.
33000.00	4	9	13	11	92	51	-3262
33100.00	2	41	15	5	183	57	-3343
33200.00	1	58	16	4	206	58	-3520
33300.00	1	53	16	5	173	56	-3722
33400.00	2	41	15	6	142	52	-3891
33500.00	2	36	13	6	140	49	-4027
33600.00	2	40	14	8	128	49	-4161
33700.00	2	29	13	28	106	54	-4281
33800.00							
Pg. Tot.				73	1170	427	
Cum. Tot.				546	4905	2162	

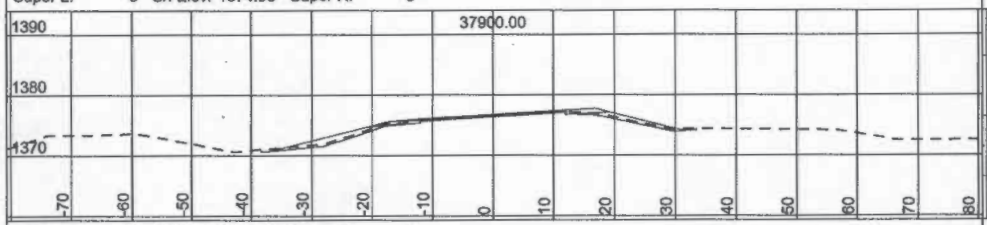
CROSS SECTIONS	STA.	32950.00	TO	STA.	33750.00	PROJECT NO. S.A.P. 011-604-017	Page 5 of 37



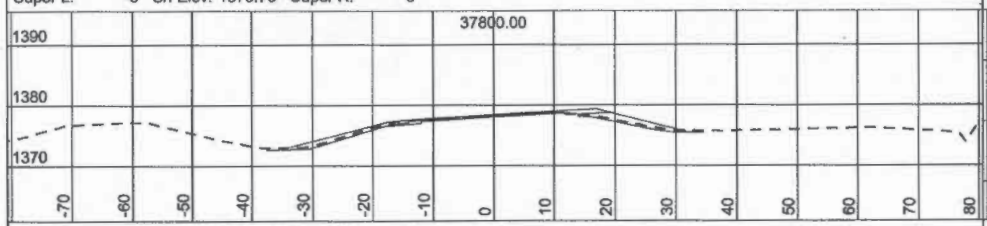
Super L: -6 Srf Elev: 1372.85 Super R: 6



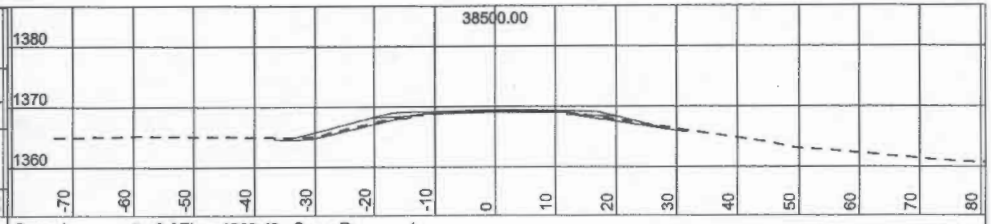
Super L: -6 Srf Elev: 1374.95 Super R: 6



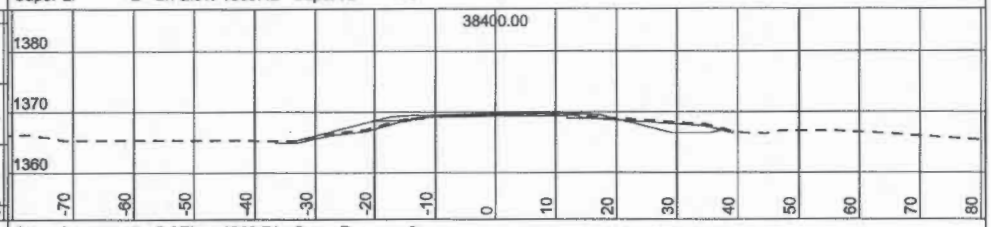
Super L: -6 Srf Elev: 1376.76 Super R: 6



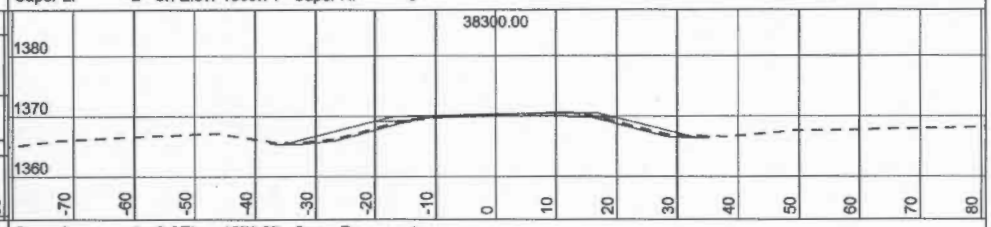
Super L: -6 Srf Elev: 1378.38 Super R: 6



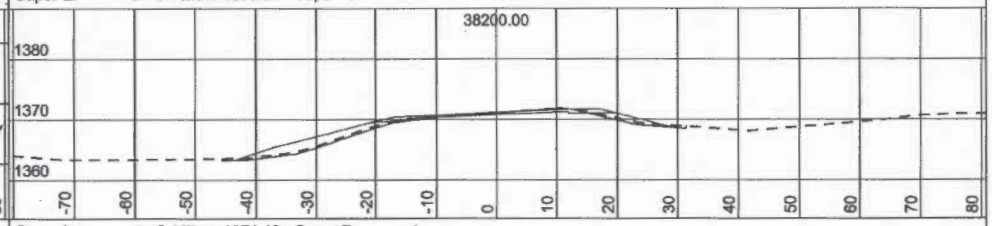
Super L: -2 Srf Elev: 1369.42 Super R: -1



Super L: -2 Srf Elev: 1369.71 Super R: 0



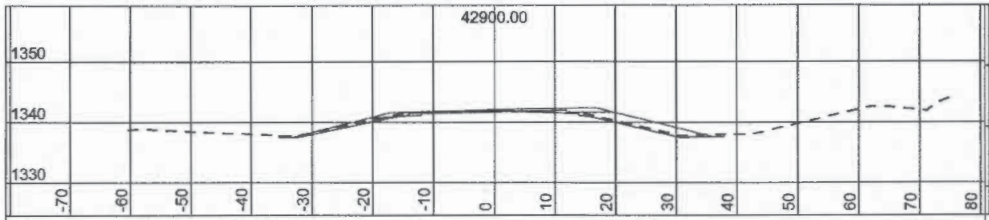
Super L: -2 Srf Elev: 1370.37 Super R: 1



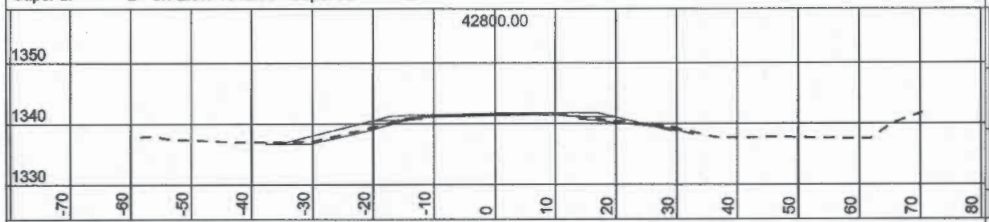
Super L: -4 Srf Elev: 1371.12 Super R: 4

L-Stn ft.	Cut A. Sq. ft.	Fill A. Sq. ft.	Strip A. Sq. ft.	SG Cut V. Cu. Yd.	SG Fill V. Cu. Yd.	Strip V. Cu. Yd.	Mass H. Cu. Yd.
37800.00	2	39	15				
37900.00	2	35	15	8	137	54	-10295
38000.00	1	39	15	6	137	55	-10424
38100.00	3	50	18	8	165	62	-10554
38200.00	2	61	16	8	235	66	-10712
38300.00	2	47	15	7	212	62	-10939
38400.00	17	20	16	26	124	54	-11144
38500.00	1	32	13	33	98	54	-11243
38600.00				3	147	55	-11307
Pg. Tot.				98	1255	463	
Cum. Tot.				1352	12804	4947	

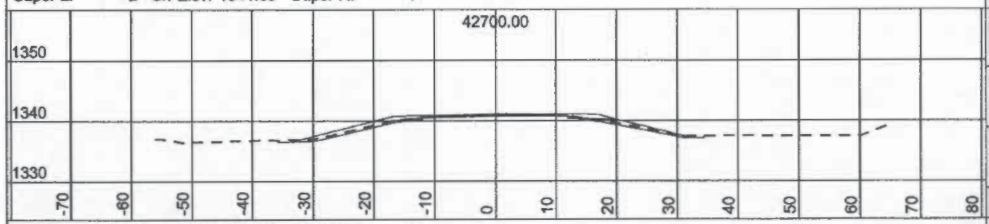
CROSS SECTIONS	STA.	37750.00	TO	STA.	38550.00	PROJECT NO. S.A.P. 011-604-017	Page 11 of 37



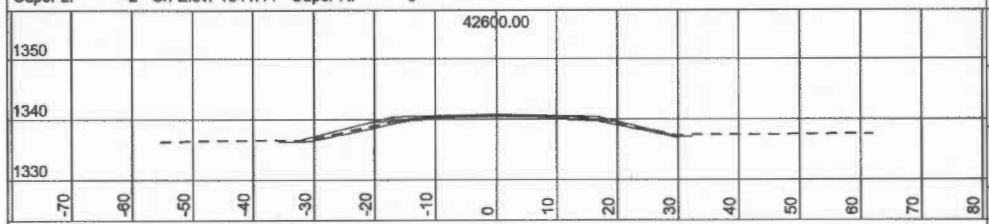
Super L: -2 Srf Elev: 1342.03 Super R: 2



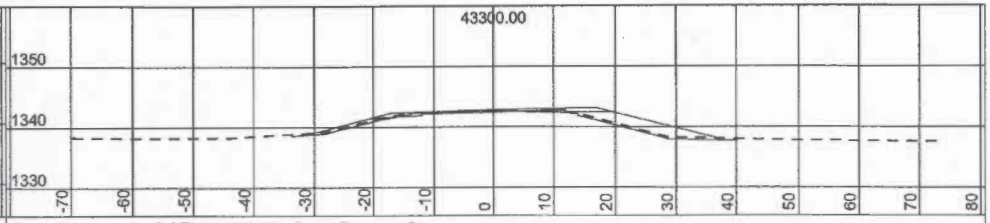
Super L: -2 Srf Elev: 1341.69 Super R: 1



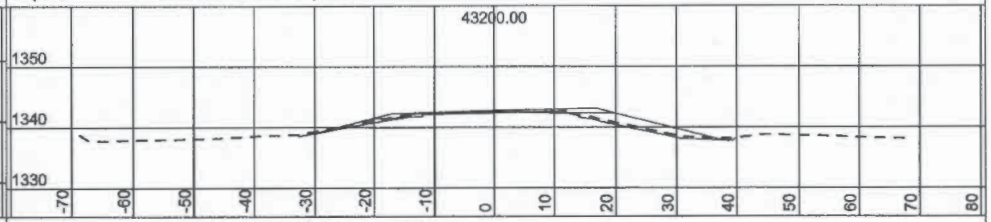
Super L: -2 Srf Elev: 1341.11 Super R: 0



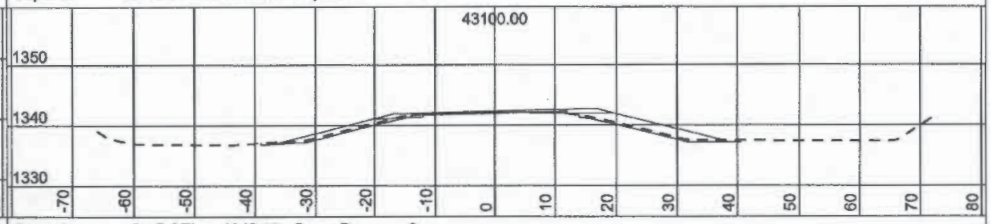
Super L: -2 Srf Elev: 1340.81 Super R: -2



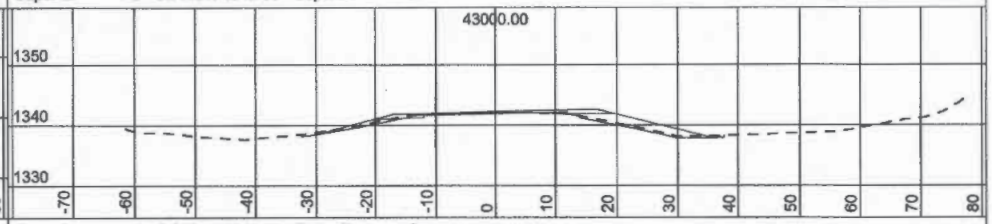
Super L: -2 Srf Elev: 1342.82 Super R: 2



Super L: -2 Srf Elev: 1342.71 Super R: 2



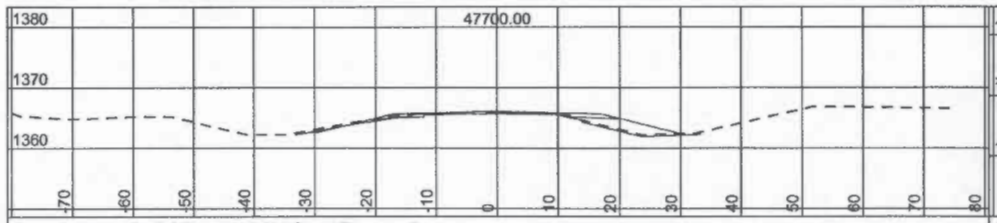
Super L: -2 Srf Elev: 1342.35 Super R: 2



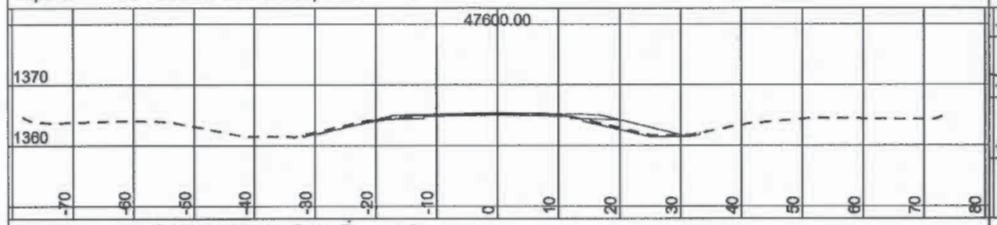
Super L: -2 Srf Elev: 1342.23 Super R: 2

L-Stn ft.	Cut A. Sq. ft.	Fill A. Sq. ft.	Strip A. Sq. ft.	SG Cut V. Cu. Yd.	SG Fill V. Cu. Yd.	Strip V. Cu. Yd.	Mass H. Cu. Yd.
42600.00	2	24	13	6	100	50	-16450
42700.00	1	32	14	4	130	52	-16544
42800.00	2	37	14	4	174	55	-16670
42900.00	1	47	15	4	175	54	-16840
43000.00	1	47	14	3	218	57	-17011
43100.00	1	70	17	3	220	59	-17226
43200.00	1	49	15	4	205	55	-17443
43300.00	1	62	15	68	154	61	-17643
43400.00							
Pg. Tot.				96	1375	443	
Cum. Tot.				2291	20020	7610	

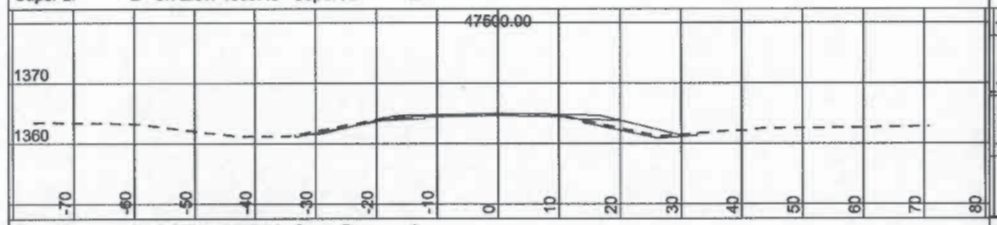
CROSS SECTIONS	STA.	42550.00	TO	STA.	43350.00	PROJECT NO. S.A.P. 011-604-017	Page 17 of 37



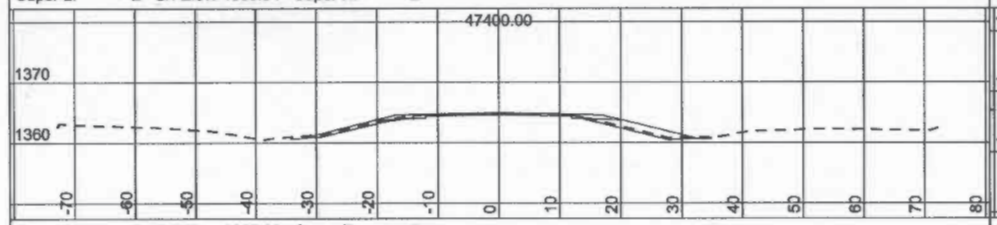
Super L: -2 Srf Elev: 1366.13 Super R: -2



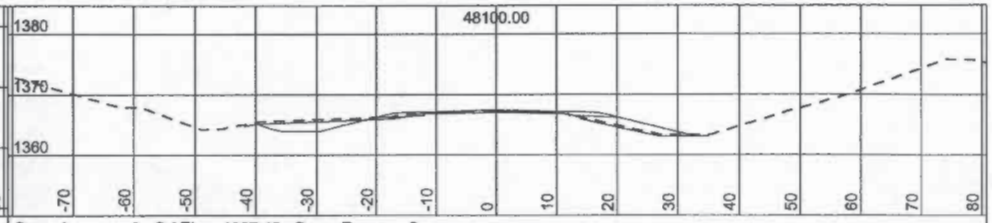
Super L: -2 Srf Elev: 1365.43 Super R: -2



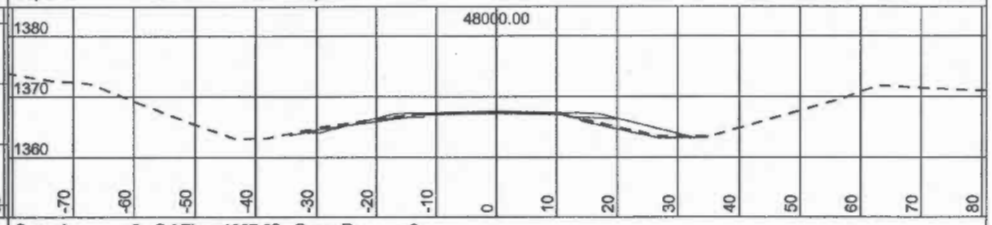
Super L: -2 Srf Elev: 1365.04 Super R: -2



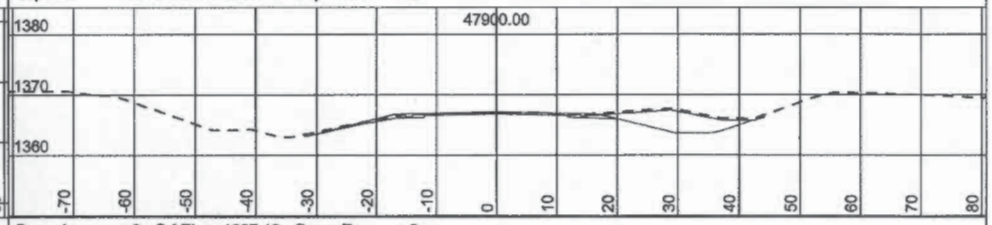
Super L: -2 Srf Elev: 1365.03 Super R: -2



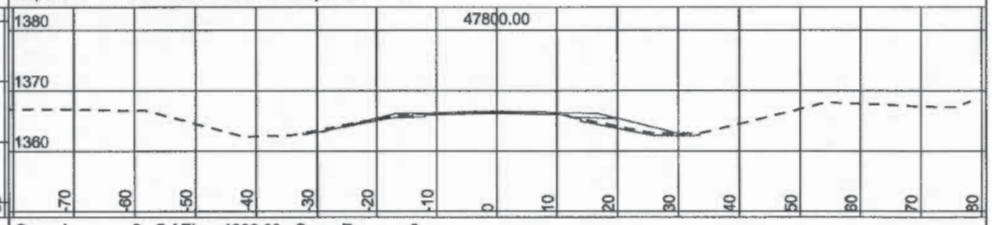
Super L: -2 Srf Elev: 1367.45 Super R: -2



Super L: -2 Srf Elev: 1367.62 Super R: -2



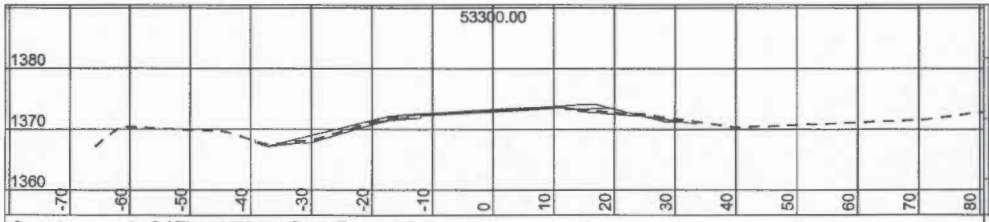
Super L: -2 Srf Elev: 1367.19 Super R: -2



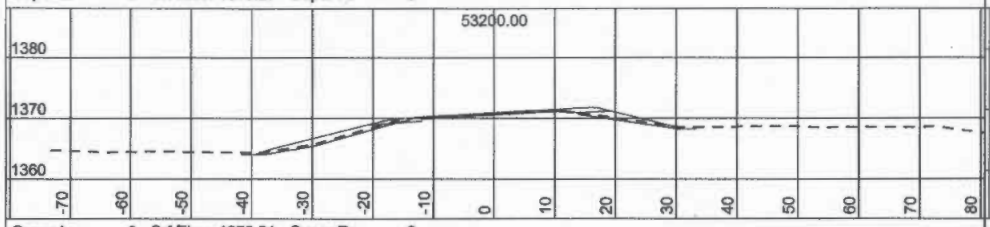
Super L: -2 Srf Elev: 1366.60 Super R: -2

L-Stn ft.	Cut A. Sq. ft.	Fill A. Sq. ft.	Strip A. Sq. ft.	SG Cut V. Cu. Yd.	SG Fill V. Cu. Yd.	Strip V. Cu. Yd.	Mass H. Cu. Yd.
47400.00	2	35	14	10	113	48	-23204
47500.00	4	26	13	11	97	46	-23307
47600.00	2	26	12	8	115	46	-23394
47700.00	2	36	13	7	120	47	-23501
47800.00	2	29	12	102	60	53	-23613
47900.00	53	3	16	104	69	55	-23571
48000.00	3	34	14	42	122	55	-23536
48100.00	20	32	16	39	115	53	-23616
48200.00							
Pg. Tot.				323	810	403	
Cum. Tot.				3181	26872	10220	

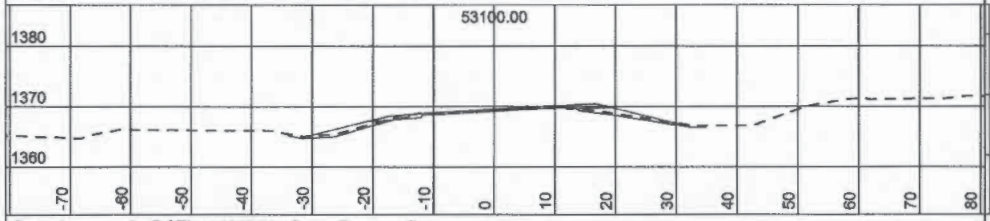
CROSS SECTIONS	STA.	47350.00	TO	STA.	48150.00	PROJECT NO. S.A.P. 011-604-017	Page 23 of 37



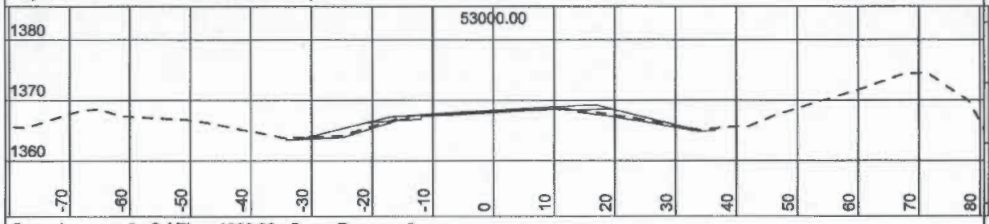
Super L: -6 Srf Elev: 1373.27 Super R: 6



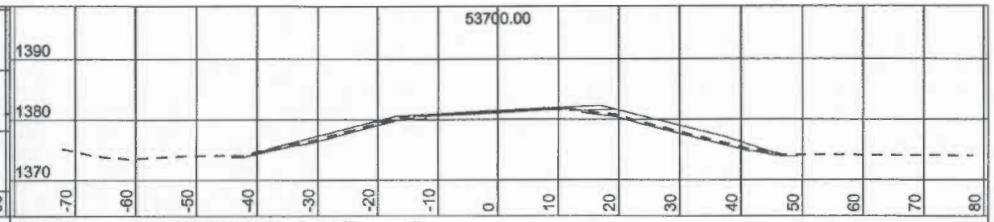
Super L: -6 Srf Elev: 1370.91 Super R: 6



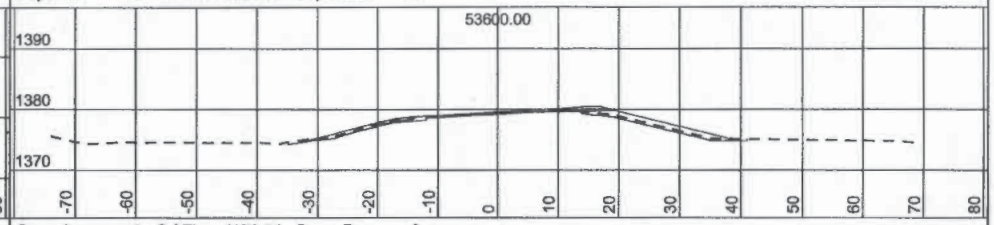
Super L: -6 Srf Elev: 1369.55 Super R: 6



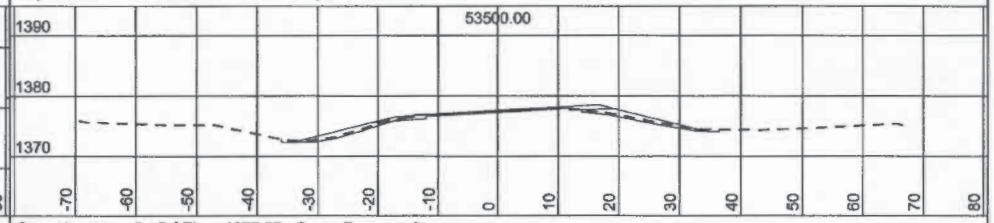
Super L: -6 Srf Elev: 1368.28 Super R: 6



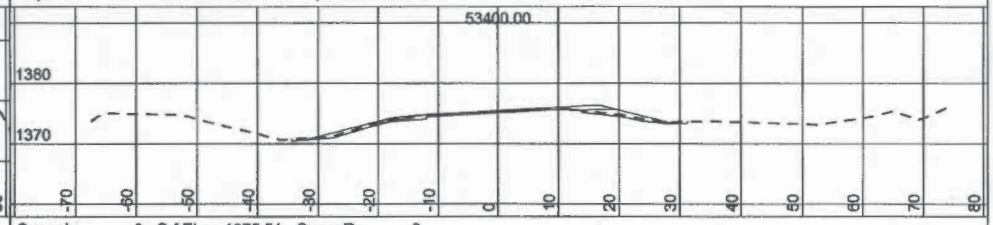
Super L: -5 Srf Elev: 1381.50 Super R: 5



Super L: -6 Srf Elev: 1379.54 Super R: 6



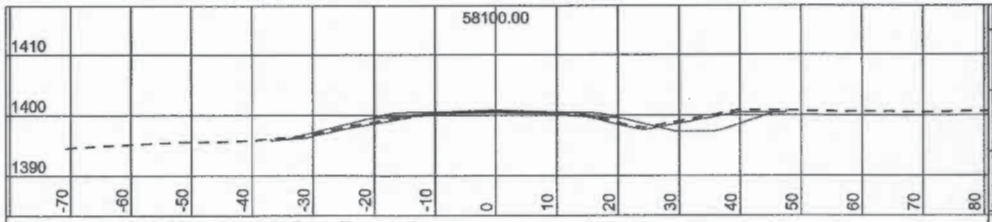
Super L: -6 Srf Elev: 1377.57 Super R: 6



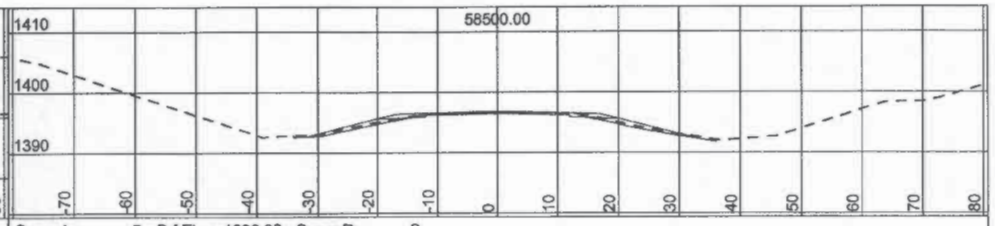
Super L: -6 Srf Elev: 1375.51 Super R: 6

L-Stn ft	Cut A. Sq. ft.	Fill A. Sq. ft.	Strip A. Sq. ft.	SG Cut V. Cu. Yd.	SG Fill V. Cu. Yd.	Strip V. Cu. Yd.	Mass H. Cu. Yd.
53000.00	2	38	14	6	129	51	-31514
53100.00	2	32	14	7	145	54	-31637
53200.00	2	46	16	9	134	56	-31775
53300.00	3	27	15	10	97	50	-31900
53400.00	2	26	12	9	117	50	-31987
53500.00	3	37	15	9	144	56	-32094
53600.00	2	40	16	8	218	69	-32229
53700.00	2	68	22	6	210	72	-32439
53800.00							
Pg. Tot.				65	1194	459	
Cum. Tot.				3745	36388	13492	

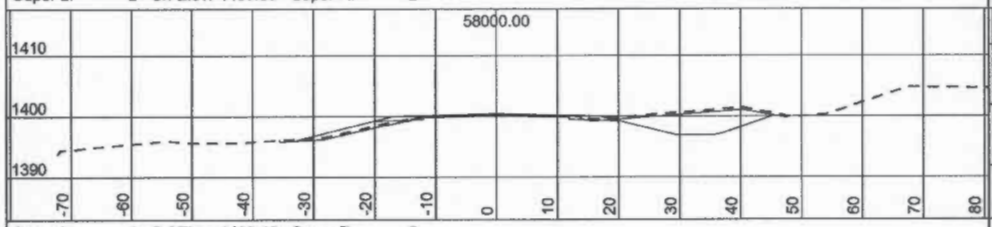
CROSS SECTIONS	STA.	52950.00	TO	STA.	53750.00	PROJECT NO. S.A.P. 011-604-017	Page 30 of 37



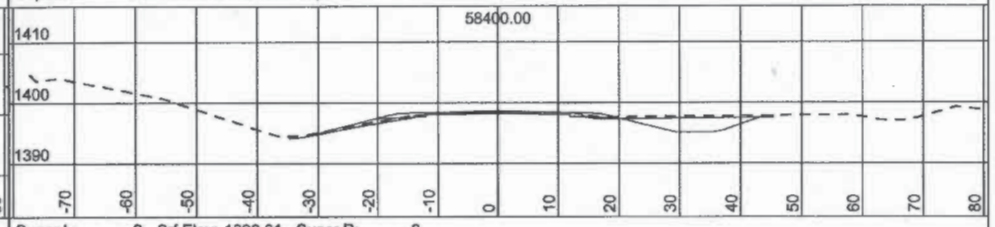
Super L: -2 Srf Elev: 1400.80 Super R: -2



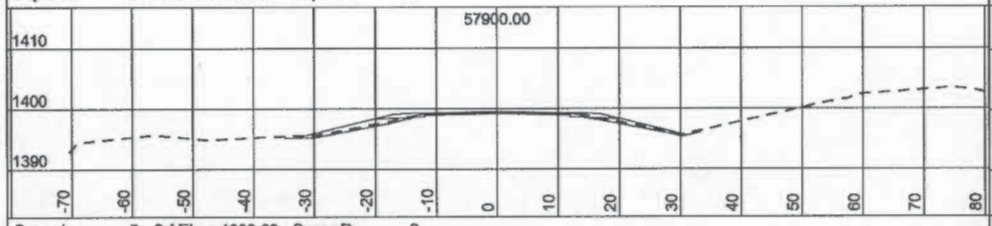
Super L: -2 Srf Elev: 1396.83 Super R: -2



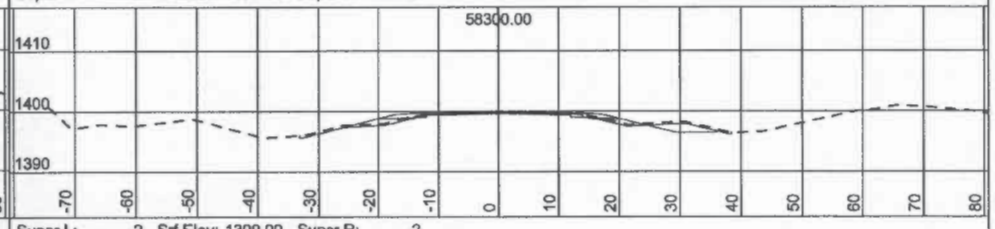
Super L: -2 Srf Elev: 1400.46 Super R: -2



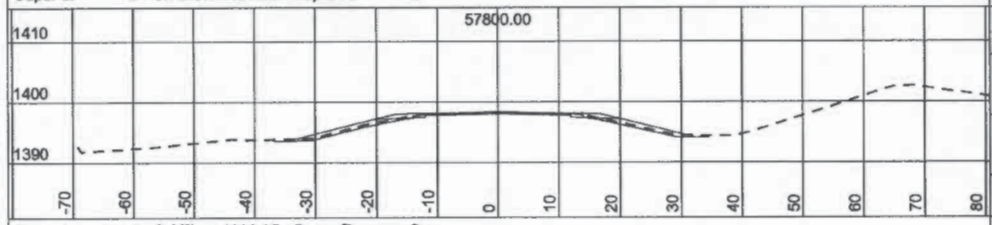
Super L: -2 Srf Elev: 1398.61 Super R: -2



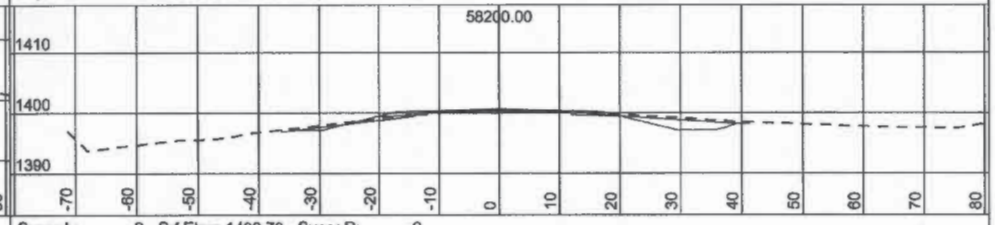
Super L: -2 Srf Elev: 1399.60 Super R: -2



Super L: -2 Srf Elev: 1399.99 Super R: -2



Super L: -2 Srf Elev: 1398.35 Super R: -2



Super L: -2 Srf Elev: 1400.70 Super R: -2

L-Stn ft.	Cut A. Sq. ft.	Fill A. Sq. ft.	Strip A. Sq. ft.	SG Cut V. Cu. Yd.	SG Fill V. Cu. Yd.	Strip V. Cu. Yd.	Mass H. Cu. Yd.
57800.00	2	35	14	6	123	51	-36540
57900.00	2	32	13	122	98	58	-36658
58000.00	65	21	18	176	91	68	-36633
58100.00	30	29	19	104	64	65	-36548
58200.00	26	6	16	69	43	57	-36509
58300.00	12	17	14	88	54	58	-36483
58400.00	36	12	17	70	71	58	-36449
58500.00	2	26	14	7	88	51	-36450
58600.00							
Pg. Tot.				642	633	466	
Cum. Tot.				5438	41968	16230	

CROSS SECTIONS	STA.	57750.00	TO	STA.	58550.00	PROJECT NO. S.A.P. 011-604-017	Page 36 of 37