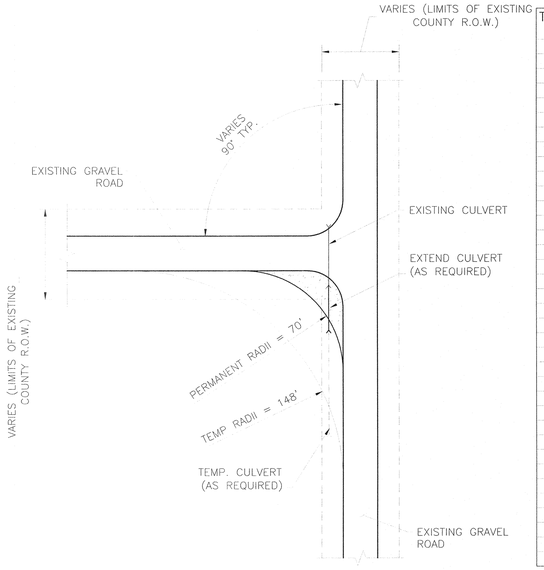


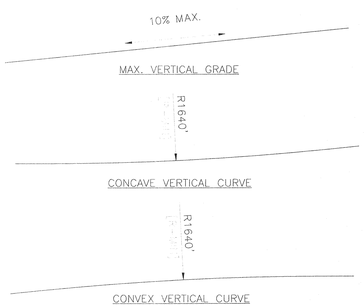
1 DETAIL: STATE OR COUNTY ROAD INTERSECTION
NO SCALE

TURBINE TABLE

TURBINE	NORTHING	EASTING	COORD_SYS	ELEVATION (TOC)	SRC_X	SRC_Y	SRC_COORD_SYS
301	474810.187	1728540.387	SPCS ND South NAD83 (US Feet)	2115.31	312773.314	5204170.605	UTM WGS 84 zone 14 meter
302	474796.784	1730210.302	SPCS ND South NAD83 (US Feet)	2114.39	313282.180	5204156.762	UTM WGS 84 zone 14 meter
303	476234.024	1732826.394	SPCS ND South NAD83 (US Feet)	2149.86	314087.888	5204579.504	UTM WGS 84 zone 14 meter
304	476451.838	1734821.326	SPCS ND South NAD83 (US Feet)	2169.84	314697.158	5204634.229	UTM WGS 84 zone 14 meter
305	479234.714	1734896.865	SPCS ND South NAD83 (US Feet)	2159.85	314736.444	5205481.925	UTM WGS 84 zone 14 meter
306	478443.661	1733959.685	SPCS ND South NAD83 (US Feet)	2196.64	314446.196	5205246.313	UTM WGS 84 zone 14 meter
307	478900.020	1731321.367	SPCS ND South NAD83 (US Feet)	2173.50	313644.781	5205400.819	UTM WGS 84 zone 14 meter
308	465076.983	1681829.836	SPCS ND South NAD83 (US Feet)	2182.74	298479.855	5201476.991	UTM WGS 84 zone 14 meter
309	465772.766	1683432.282	SPCS ND South NAD83 (US Feet)	2201.68	298972.335	5201679.700	UTM WGS 84 zone 14 meter
310	465009.917	1685718.907	SPCS ND South NAD83 (US Feet)	2201.75	299664.825	5201433.832	UTM WGS 84 zone 14 meter
311	465908.097	1687038.692	SPCS ND South NAD83 (US Feet)	2222.92	300072.332	5201699.881	UTM WGS 84 zone 14 meter
312	466874.452	1687995.520	SPCS ND South NAD83 (US Feet)	2227.54	300369.610	5201988.828	UTM WGS 84 zone 14 meter
313	467945.806	1689178.086	SPCS ND South NAD83 (US Feet)	2297.32	300736.304	5202308.458	UTM WGS 84 zone 14 meter
314	470017.614	1692287.591	SPCS ND South NAD83 (US Feet)	2245.11	301696.154	5202921.756	UTM WGS 84 zone 14 meter
315	470920.698	1689131.809	SPCS ND South NAD83 (US Feet)	2251.17	300739.581	5203215.447	UTM WGS 84 zone 14 meter
316	471300.553	1686615.904	SPCS ND South NAD83 (US Feet)	2266.32	299974.976	5203345.926	UTM WGS 84 zone 14 meter
317	470130.632	1685997.575	SPCS ND South NAD83 (US Feet)	2320.64	299779.678	5202992.957	UTM WGS 84 zone 14 meter
318	469272.692	1683444.468	SPCS ND South NAD83 (US Feet)	2222.43	298996.497	5202746.382	UTM WGS 84 zone 14 meter
319	472405.901	1678612.934	SPCS ND South NAD83 (US Feet)	2244.82	297542.185	5203729.601	UTM WGS 84 zone 14 meter
320	472660.913	1677037.857	SPCS ND South NAD83 (US Feet)	2292.48	297063.599	5203816.534	UTM WGS 84 zone 14 meter
321	472194.776	1675563.737	SPCS ND South NAD83 (US Feet)	2259.55	296611.568	5203683.073	UTM WGS 84 zone 14 meter
322	475741.645	1674235.469	SPCS ND South NAD83 (US Feet)	2261.22	296227.451	5204771.912	UTM WGS 84 zone 14 meter
323	476919.296	1674519.280	SPCS ND South NAD83 (US Feet)	2261.34	296320.841	5205129.197	UTM WGS 84 zone 14 meter
324	477478.095	1677130.106	SPCS ND South NAD83 (US Feet)	2272.73	297119.878	5205284.251	UTM WGS 84 zone 14 meter
325	480714.758	1673325.768	SPCS ND South NAD83 (US Feet)	2271.93	295979.258	5206293.022	UTM WGS 84 zone 14 meter
326	480302.734	1675657.674	SPCS ND South NAD83 (US Feet)	2292.88	296687.605	5206153.800	UTM WGS 84 zone 14 meter
327	481022.001	1676696.470	SPCS ND South NAD83 (US Feet)	2265.48	297008.433	5206366.954	UTM WGS 84 zone 14 meter
328	482579.283	1679679.975	SPCS ND South NAD83 (US Feet)	2289.68	297926.899	5206824.154	UTM WGS 84 zone 14 meter
329	486325.344	1678664.836	SPCS ND South NAD83 (US Feet)	2295.55	297639.406	5207971.870	UTM WGS 84 zone 14 meter
330	485850.378	1681157.318	SPCS ND South NAD83 (US Feet)	2286.37	298396.320	5207812.520	UTM WGS 84 zone 14 meter
331	483016.602	1682444.136	SPCS ND South NAD83 (US Feet)	2295.74	298771.955	5206941.277	UTM WGS 84 zone 14 meter
332	482498.929	1684094.642	SPCS ND South NAD83 (US Feet)	2290.34	299271.988	5206773.840	UTM WGS 84 zone 14 meter
333	479789.894	1683703.227	SPCS ND South NAD83 (US Feet)	2302.18	299136.844	5205950.436	UTM WGS 84 zone 14 meter
334	479317.966	1682103.26	SPCS ND South NAD83 (US Feet)	2271.62	298646.426	5205815.952	UTM WGS 84 zone 14 meter
335	477533.311	1682092.116	SPCS ND South NAD83 (US Feet)	2242.18	298632.594	5205272.067	UTM WGS 84 zone 14 meter

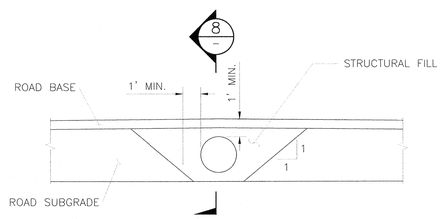
CULVERT TABLE

CULVERT NUMBER	ALIGNMENT	STATION	SIZE (INCHES)	LENGHT (FEET)	ELEVATION IN	ELEVATION OUT
1	3-B1	1+75	18	50	2276.1	2275.8
1A	MET ENTRANCE	SH. C-07	18	70	2252.8	2251.7
2	3-B1	18+75	24	60	2270.7	2270.2
3	3-B1	32+25	3-24	90	2264.6	2264.4
4	3-B1	50+15	24	60	2271.6	2270.9
4A	30TH ST. SW	SH. C-09	18	35	2248.2	2248.0
5	3-B2	14+10	30	65	2251.0	2250.7
6	3-B2	21+50	24	55	2260.3	2259.9
7	3-C1	11+85	18	65	2231.6	2231.0
8	3-C1	29+35	36	80	2226.0	2225.4
9	3-C1	41+70	24	95	2253.5	2252.9
10	3-C1	43+00	24	80	2254.7	2254.5
11	3-C1	51+85	18	65	2262.9	2262.3
12	3-C1	61+00	18	55	2277.3	2276.7
13	3-C1	70+45	24	60	2261.7	2261.4
14	3-C1	82+00	18	55	2256.7	2256.3
15	3-C2	16+50	24	110	2269.2	2268.2
16	3-C2	31+00	18	110	2264.0	2262.6
17	3-D1	0+15	30	90	2180.9	2177.7
18	3-D1	16+25	24	85	2199.8	2199.2
19	3-D1	30+85	36	75	2214.8	2214.6
20	3-D1	50+60	36	75	2240.7	2240.3
21	3-D1	59+30	24	60	2256.5	2256.0
22	3-D1	69+50	18	70	2267.6	2267.1
23	3-D1	41+00	18	150	2234.2	2231.9
24	3-D3	1+25	18	150	2257.6	2251.4
25	3-E1	4+00	42	60	2222.9	2221.4
26	3-E1	20+00	30	60	2225.0	2224.1
27	3-E1	26+50	24	120	2245.0	2239.9
28	3-E1	43+00	18	55	2230.2	2228.6
29	3-E2	4+00	18	100	2250.2	2246.3
30	3-F1	17+60	30	60	2227.2	2227.0
31	3-F1	20+00	24	75	2227.5	2227.1
32	3-F1	35+60	18	125	2230.9	2230.8
32A	WTG 314	SH. C-22	12	72	2241.3	2241.2
34	3-I	0+20	18	200	2170.9	2167.6
35	3-J2	0+20	18	200	2185.5	2182.5
36	3-J1	0+20	18	125	2186.2	2184.9
38	3-J1	37+60	30	65	2212.7	2212.3
39	3-L1	2+25	24	55	2110.2	2109.4
39A	3-L1	SH. C-27	18	62	2113.3	2112.2
40	3-L1	10+75	18	55	2115.3	2115.2
41	3-L1	13+15	30	70	2116.5	2116.0
42	3-L1	27+15	30	55	2129.6	2129.4
43	3-L1	53+00	24	60	2145.6	2144.2
43A	3-L1	62+25	24	60	2139.3	2138.5
43B	3-L5	19+00	18	120	2164.2	2161.8
44	3-L1	41+00	18	125	2173.1	2172.7
45	3-L3	9+45	24	55	2145.5	2144.3
46	3-L4	1+45	18	125	2129.7	2127.3
47	3-M1	10+75	18	50	2096.3	2096.2
48	3-M1	26+90	18	55	2095.3	2094.6
49	3-M1	27+40	18	55	2094.6	2094.4
50	3-M1	32+20	3-36	60	2091.7	2091.2
51	3-M1	34+80	30	70	2092.9	2091.8

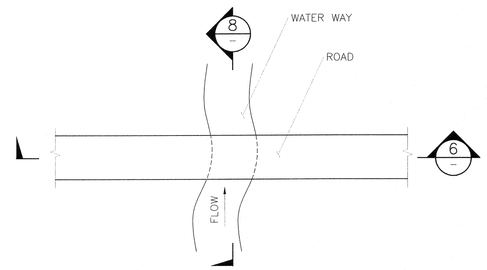


2 DETAIL: VERTICAL ROAD GRADES AND CURVES
NO SCALE

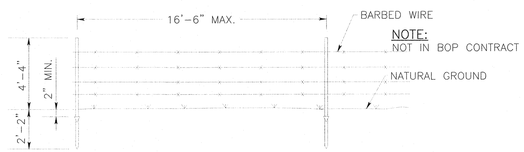
NOTE: HEIGHT CLEARANCE MIN. 26'. CONTRACTOR IS RESPONSIBLE FOR MOVING ITEMS WITHIN CLEARANCE ZONE AND RESTORING.



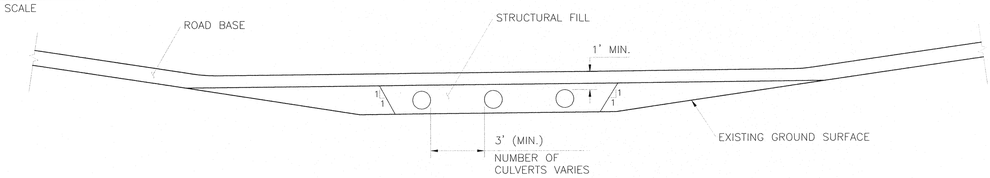
6 SECTION: CULVERT CROSSING
0 1 4
SCALE



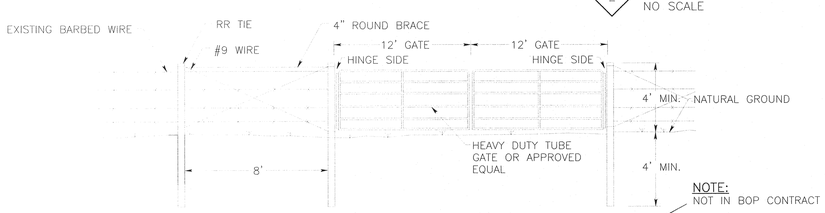
5 PLAN: CULVERT CROSSING
NO SCALE



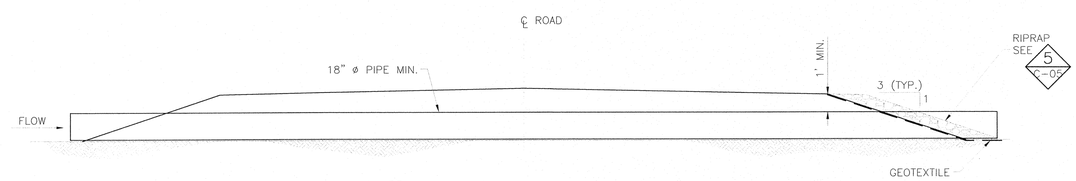
3 DETAIL: FENCE
NO SCALE



7 SECTION: SWALE CROSSING MULTIPLE CULVERTS
NO SCALE



4 DETAIL: TYPICAL GATE DETAIL
NO SCALE



8 SECTION: CULVERT CROSSING
0 4 8
SCALE IN FEET

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
A	KKB	CAD	JXB	07/15/11	60 PERCENT SUBMITTAL
B	CAD	CAD	JXB	09/02/11	90 PERCENT SUBMITTAL
0	CAD	CAD	JXB	09/30/11	ISSUED FOR CONSTRUCTION
1	DMD	CAD	JXB	10/14/11	REVISED TURBINES COORDINATES
2	CAD	CAD	JXB	10/31/11	REVISED SRC_LAT, SRC_LONG
3	NJG			2/6/13	CONSTRUCTION REVISIONS

REGISTERED PROFESSIONAL ENGINEER MATTHEW T. FREUDENRICH 8229 DATE REV.3 NORTH DAKOTA

RELEASED TO/FOR	A	B	C	0	1	2	3
CLIENT	07/15/11	09/02/11					
BID							
CONSTRUCTION				09/30/11	10/14/11	10/31/11	
PERMITTING							
	DATE RELEASED						

BARR
Corporate Headquarters:
Minneapolis, Minnesota
Ph: 1-800-632-2277

Project Office:
BARR ENGINEERING CO.
4700 WEST 77TH STREET
MINNEAPOLIS, MN.
55435-4803
Ph: 1-800-632-2277
Fax: (952) 832-2601
www.barr.com

Scale	AS SHOWN
Date	07/05/11
Drawn	KKB
Checked	JXB
Designed	CAD
Approved	JXB

minnesota power — ALLETE COMPANY — Bison

A WIND ENERGY INITIATIVE OF MINNESOTA POWER IN NORTH DAKOTA

BISON 3 WIND PROJECT
MORTON & OLIVER COUNTIES, NORTH DAKOTA

MISCELLANEOUS SECTIONS AND DETAILS

BARR PROJECT No. 34/30-1006
CLIENT PROJECT No.
DWG. No. C-04
REV. No. 3