INVESTIGATION OF 2011 FLOODING CONCERNS

FOR THE

City of Ramsey
Anoka County, Minnesota

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Tim Eggerichs, P.E.	43362 License No.	February 14, 2012 Date
Ronald J. Wagner, P.E.	26052 License No.	February 14, 2012 Date

TABLE OF CONTENTS

SUMMARIES AND RECOMMENDATIONS

148th Lane

There is an existing low area on the south side of 148th Lane. During the wet spring of 2011, stormwater would pond for extended periods in this low area. A 15" outlet exists approximately 2.5 feet above the bottom of the low area that drains the area to the east. The stormwater below the outlet pipe infiltrates into the soil. A drainage easement exists over this low area.

Different sized outlet pipes at different elevations were analyzed. These different sized outlets did not have a significant impact on the high water level in the area. Since the low area is within an existing drainage easement, it is our recommendation that nothing be changed in the area.

149th Lane

There is an existing low area on the east side of Lot 3, Block 1 of Ramsey Meadows 4th Addition (5410 149th Lane NW). This low area is connected to the large DNR Wetland to the east with a drain tile. During the wet spring of 2011, stormwater would back up through this drain tile and flooded the low area. It appears that this low area may have been constructed as part of a wetland mitigation plan and may be controlled by Wetland Conservation Act rules. A drainage easement exists over this low area.

The outlet from the DNR Wetland, which drains east under Trunk Highway 47 (TH 47), was analyzed. The current outlet has a weir structure that is approximately 0.8 feet above the invert of the 15" pipe that crosses TH 47. Additional culverts under TH 47 were analyzed, but the additional outlets did not have a significant impact on the high water levels in the DNR Wetland. Removing the weir structure was also analyzed.

It is our recommendation that the weir structure be removed from the outlet. This will not have a significant impact on the high water level of the wetland; however, the wetland will drain down to an elevation near the elevation of the bottom of the low area at 5410 149th Lane. The estimated cost to remove the weir structure is $1,265.

Rum River Hills Golf Club

Rum River Hills Golf Club has been experiencing flooding issues throughout the golf course. The large ponds near the clubhouse drain to the east through an existing outlet structure and 12" pipe. This stormwater then drains over an existing steel weir structure and over a rock dam prior to discharging to the Rum River.

Area 1

The ponds near the clubhouse have been flooding and the outlet does not seem to drain the ponds effectively. The existing 12" outlet from the large ponds near the clubhouse has several sags in it and several joints have been compromised.

It is our recommendation to replace this pipe and install a new outlet structure with removable planks that will give the golf course more flexibility in controlling the water

elevation in the ponds. This includes an 18" HDPE outlet and precast concrete outlet structure with a removable grate for access to the planks. It is proposed to leave the overflow at the same elevation as existing, which will have minimal impacts on the elevation of the standing water and the high water levels of the ponds. The estimated cost to install this new outlet is $29,853.

Area 2

Based on the high water levels in the ponds near the clubhouse, it appears flooding of the cart paths near Hole #1 may be an issue during large storm events. The existing culverts consist of a 12" CMP and 15" HDPE.

To reduce the frequency of the flooding, we recommend installing 24" diameter culverts under the two existing cart paths. The paths would continue to be inundated during storm events greater than 3.5", but would not be inundated during storm events less than 3.5". The estimated cost to replace the culverts is $6,642. If the golf course does not feel that the cart path flooding is a concern, replacing the culverts is not a necessity.

Area 3

The soil in the fairway of Hole #15 has become saturated. There is an existing rock dam southeast of this fairway and it appears that water being contained by the rock dam may be infiltrating into the soil and saturating the fairway.

We recommend lining the creek upstream of the rock dam with an impermeable liner and replacing and/or installing new drain tile in the fairway of Hole #15. Lining the creek will eliminate the infiltration into the soil and the drain tile will keep the soil from becoming saturated. The estimated cost for these improvements is $13,530.

Area 4

Holes #3 and #17 have had flooding issues. The ponds and swales near the two holes are drained through three 15" CMP culverts.

Different sized culverts at different elevations were analyzed. These different sized culverts did not have a significant impact on the high water levels in the area. Without lowering the entire swale and creating more storage, it does not appear that replacing the culverts would have a significant impact. It is our recommendation that the three culverts not be replaced.

163rd Lane

There is an existing, landlocked low area south of 163rd Lane and east of Wolfram Street. During a majority of the year, stormwater runoff infiltrates into the soil. However, during early spring when the ground is frozen and during periods of heavy rainfall, water levels have risen to levels that cause flooding of adjacent properties.

Different sized outlet pipes were analyzed to drain the low area. Installing an outlet will have a significant impact on the high water levels in the area and, most importantly, the length of inundation will be greatly reduced. We recommend directionally drilling an

18" HDPE pipe south to County Ditch #3 with an invert elevation of 872.0. Installing the pipe at an elevation of 872.0 will continue to allow 3" storm events to infiltrate into the soil. The estimated cost to install this outlet is $80,795.

156th Lane

During large storm events, the wetland in Woodland Green Park ponds water in the backyard of 5220 156th Lane. The area where water ponds was platted with a 75-foot drainage and utility easement, however, this easement has been vacated. The wetland discharges east through an existing storm sewer system to a low area and then north through another storm sewer system to the Rum River.

Different sized ponds and outlet configurations were analyzed. One alternative to reduce the high water level of the wetland in Woodland Green Park included constructing a new outlet pipe from the wetland to the low area to the east. This alternative would also require constructing a new outlet at a lower elevation from the low area directly to the Rum River. This would require the approval of the Minnesota Department of Natural Resources and does not appear viable at this time.

We recommend filling the backyard of 5220 156th Lane to an elevation equal to the 100-year high water level. Stormwater would then be contained within Woodland Green Park and would not impact this homeowner. Filling the backyard would require grading in the Woodland Green Park site to create storage to compensate for the lost volume. The estimated cost to complete the grading is $21,175.

Sodium Street

The house at 16756 Sodium Street has been experiencing water in the basement. One reason for having water in the basement could be caused by the road ditch in front of the house filling and then overflowing toward the house. The water then seeps along the basement wall and eventually into the basement. Another reason for water in the basement could be caused by a high groundwater elevation in the area.

We recommend installing a culvert under Sodium Street, regrading the west ditch of Sodium Street, constructing a berm to keep the water in the ditch, and replacing the existing driveway culvert. The ditch would be graded to drain south and a culvert would be installed near the south property line to drain the water to the west. The estimated cost to complete this project is $12,225.

Section 1
148th Lane

148th Lane

Description

As shown on Exhibit 1, a low area exists south of 148th Lane. A 15" outlet pipe drains the low area north and then east to DNR Wetland 658W. The invert of the outlet pipe is at elevation 862.3 and the bottom of the low area is at elevation 859.8. Water in the low area has to rise 2.5 feet prior to discharging. The water below the outlet infiltrates into the soil, which may take days depending on the condition of the soil.

The existing 100-year high water level (HWL) for the low area is 865.5. As shown on Exhibit 2, a drainage easement exists in the rear of Lots 2 through 5, Block 2 of Ramsey Commons 2nd Addition.

Alternatives

The following alternatives address the water elevation in the existing low area.

Alternative 1
In this alternative, a new outlet pipe would be installed between Lot 1 of Ramsey Commons 2nd Addition and Lot 2 of Sunny Ponds, as shown on Exhibit 3. It was assumed that the existing outlet pipe to the north would be removed. By installing an outlet pipe in this location, the invert of the outlet pipe can be lowered from 862.3 to 861.6. The following table summarizes the 100-year HWL's and estimated costs for each outlet pipe:

Outlet Pipe Size	100-Year HWL	Estimated Cost
Existing	865.5	N/A
15"	865.4	$16,264
18"	865.1	$31,566 *
24"	864.3	$45,381 *

* The existing pipe being connected to in Germanium Street is a 15" diamter. Installing the 18" and 24" outlets will require the removal and replacement of this pipe to match the size of the pipe being installed.

Tables 1 through 3 include the individual costs for this alternative.

Alternative 2
In this alternative, a new outlet pipe would be installed between Lots 2 and 3 of Sunny Ponds, as shown on Exhibit 4. It was assumed that the existing outlet pipe to the north would be removed. By installing an outlet pipe in this location, the invert of the outlet pipe can be lowered from 862.3 to 861.4. This alternative would require additional grading and the acquisition of a permanent easement on the property south of Ramsey Commons 2nd Addition and west of Sunny Ponds. The following table summarizes the 100-year HWL's and estimated costs for each outlet pipe:

Outlet Pipe Size	100-Year HWL	Estimated Cost
Existing	865.5	N/A
15"	865.3	$13,098
18"	865.0	$18,846 *
24"	864.3	$32,543 *

* The existing pipe being connected to in Germanium Street is a 15" diameter. Installing the 18" and 24" outlets will require the removal and replacement of this pipe to match the size of the pipe being installed.

Tables 4 through 6 include the individual costs for this alternative.

Alternative 3

In this alternative, the bottom of the low area would be filled to the same elevation as the outlet pipe invert. The pond would then drain dry and would not be sitting with water until it infiltrated. By filling the bottom of th e low area, the resultant 100-year HWL will be 866.2, 0.7 feet higher than the existing HWL. This higher HWL would end up outside the existing drainage and utility easement, creating the need for additional drainage easement.

The estimated cost to fill the low area is $15,321. Table 7 includes the individual costs for this alternative.

Further research is required to determine if this low area was designed to treat a water quality volume. The volume required would dictate if Alternatives 1 and 2 are viable options. Alternative 3 would not be viable, because the water quality volume is being eliminated in this alternative.

870

RAMSEY COMMONS
2ND ADDITION

148TH LANE

15" RCP

15" RCP

15" RCP

18" RCP

18" RCP

5

3

2

1

4

Landscaping

INV=862.3
HEADWALL

BLOCK WALL

WOOD WALL

FENCE

860

862

864

866

868

NOWTHEN BOULEVARD

2

3

SUNNY PONDS

4

5

GERMANIUM STREET

860

DNR
WETLAND
658W

N

30 0 30 60
SCALE IN FEET

EXHIBIT 1
148TH LANE EXISTING CONDITIONS

CITY OF RAMSEY, MINNESOTA

Feb 13, 2012 - 2:39pm
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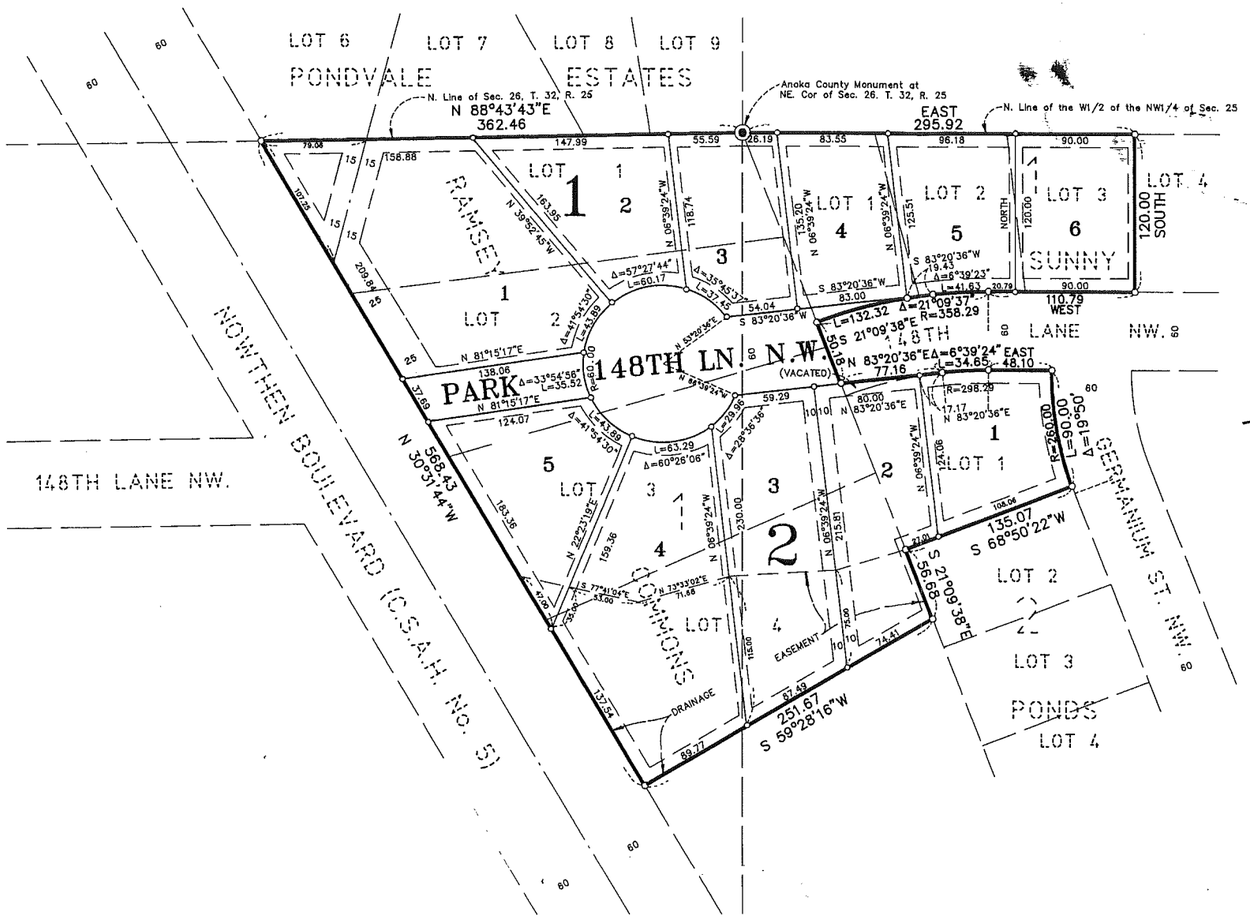
OFFICIAL PLAT

41.

RAMSEY COMMONS 2ND ADDITION

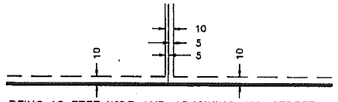
CITY OF RAMSEY — COUNTY OF ANOKA



1049281

OFFICE OF COUNTY RECORDER
STATE OF MINNESOTA, COUNTY OF ANOKA
I hereby certify that the within instrument was filed in this office for record on the JUNE 29 A.D., 1993
4:15 o'clock P.M., and was duly recorded in book 416 of Plats page 41
Edward M Trooke
County Recorder
By D Bremer
Deputy

DRAINAGE AND UTILITY EASEMENTS SHOWN THUS:



BEING 10 FEET WIDE AND ADJOINING ALL STREET RIGHT-OF-WAY LINES AND REAR LOT LINES AND 5 FEET WIDE AND ADJOINING ALL SIDE LOT LINES, UNLESS OTHERWISE SHOWN ON THE PLAT.

SCALE IN FEET
0 60 120 180
SCALE: 1 INCH = 60 FEET

○ DENOTES 1/2 INCH IRON PIPE SET.
◉ DENOTES ANOKA COUNTY MONUMENT.
NOTE: FOR THE PURPOSES OF THIS PLAT, THE NORTH LINE OF THE W1/2 OF THE NW1/4 OF SEC. 25, T. 32, R. 25 IS ASSUMED TO HAVE A BEARING OF EAST.

CAINE & ASSOCIATES LAND SURVEYORS, INC.

KNOW ALL PERSONS BY THESE PRESENTS: That North Suburban Development, Inc., a Minnesota Corporation, owner and proprietor, and Doloras S. Fleischer, single, mortgagee of the following described property situated in the County of Anoka, State of Minnesota, to-wit:

Lots 1, 2 and 3, Block 1, and Lot 1, Block 2, all in SUNNY PONDS, according to the recorded plat thereof, Anoka County, Minnesota,

And that part of vacated 148th Lane N.W., as dedicated in the plat of SUNNY PONDS, according to the recorded plat thereof, Anoka County, Minnesota, lying north of the north line of Lot 1, Block 2, in said SUNNY PONDS and lying south of the following described line:

Commencing at the northeast corner of said Lot 1, Block 2; thence on an assumed bearing of West, along the north line of said Lot 1, Block 2, a distance of 48.10 feet; thence westerly continuing along said north line and along a tangential curve, concave to the south having a radius of 298.29 feet and a central angle of 6 degrees 39 minutes 24 seconds, a distance of 34.65 feet to the point of beginning of the line to be described; thence South 83 degrees 20 minutes 36 seconds West, a distance of 77.16 feet to the intersection with the northerly extension of the west line of said Lot 1, Block 2, and said line there terminating.

AND that North Suburban Development, Inc., a Minnesota Corporation, owner and proprietor, and Delano Skeim, single, mortgagee of the following described property situated in the County of Anoka, State of Minnesota, to-wit:

Lots 1, 2, 3 and 4, Block 1, RAMSEY COMMONS, according to the recorded plat thereof, Anoka County, Minnesota.

Have caused the same to be surveyed and platted as RAMSEY COMMONS 2ND ADDITION and do hereby donate and dedicate to the public for public use forever the lane, as shown on the plat. Also dedicating the drainage and/or utility easements as shown on the plat. Also dedicating to the County of Anoka the right of access onto County State Aid Highway No. 5 from Lot 1, Block 1 and from Lots 4 and 5, Block 2. In witness whereof said North Suburban Development, Inc. has caused these presents to be signed by its proper officer this 26TH day of MAY, 1993. Also in witness whereof said Doloras S. Fleischer has hereunto set her hand this 26TH day of MAY, 1993. Also in witness whereof said Delano Skeim has hereunto set his hand this 21ST day of MAY, 1993.

NORTH SUBURBAN DEVELOPMENT, INC.

J. A. Henkveld, as President

SIGNED:

Doloras S. Fleischer
Doloras S. Fleischer

SIGNED:

Delano Skeim
Delano Skeim

STATE OF MINNESOTA) The foregoing instrument was acknowledged before me this 26TH day of MAY, 1993, by J. A.
COUNTY OF ANOKA) Henkveld, President of North Suburban Development, Inc., a Minnesota corporation, on behalf of the corporation.

SHIRLEY D. CHENOWETH
NOTARY PUBLIC-MINNESOTA
ANOKA COUNTY
My Commission Expires 6-24-96

Shirley D. Chenoweth
Notary Public, ANOKA County, Minnesota
My Commission expires 6-24-96

STATE OF MINNESOTA) The foregoing instrument was acknowledged before me this 26TH day of MAY, 1993, by Doloras
COUNTY OF ANOKA) S. Fleischer, single.

SHIRLEY D. CHENOWETH
NOTARY PUBLIC-MINNESOTA
ANOKA COUNTY
My Commission Expires 6-24-96

Shirley D. Chenoweth
Notary Public, ANOKA County, Minnesota
My Commission expires 6-24-96

STATE OF MINNESOTA) The foregoing instrument was acknowledged before me this 21ST day of May, 1993, by Delano
COUNTY OF Anoka) Skeim, single.

MARGARET A. McINERNY
NOTARY PUBLIC—MINNESOTA
ANOKA COUNTY
My Commission Expires FEB. 22, 1998

Margaret A. McInerny
Notary Public, Anoka County, Minnesota
My Commission expires 2/22/96

I hereby certify that I have surveyed and platted the land described in the dedication on this plat as RAMSEY COMMONS 2ND ADDITION; that the plat is a correct representation of said survey; that all distances are correctly shown on said plat in feet and hundredths of a foot; that the monuments have been correctly placed in the ground as shown; that the outside boundaries are correctly designated on said plat; and that there are no wet lands or public highways to be designated on said plat other than as shown thereon.

Jeffrey N. Caine
Jeffrey N. Caine, Registered Land Surveyor
Minnesota Registration No. 12251

STATE OF MINNESOTA) The surveyors certificate was acknowledged before me a Notary Public, this 19TH day of May, 1993,
COUNTY OF ANOKA) by Jeffrey N. Caine, Land Surveyor.

MOLLY W. CAINE
Notary Public-Minnesota
Anoka County
My Comm. Exp. 6-17-96

Molly W. Caine
Notary Public, Anoka County, Minnesota
My Commission expires 6-17-96

CITY OF RAMSEY

We hereby certify that the City Council of the City of Ramsey, Anoka County, Minnesota, duly accepted and approved the plat of RAMSEY COMMONS 2ND ADDITION at a regular meeting held this 11TH day of May, 1993. If applicable, the written comments and recommendations of the Commissioner of Transportation and the County Highway Engineer have been received by the city or the prescribed 30 day period has elapsed without receipt of such comments and recommendations, as provided by Hinn. Statutes, Section 505.03, Subd. 2.

By Mayor By Clerk

Checked and approved this 29TH day of June, 1993

By Anoka County Surveyor

I HEREBY CERTIFY THAT THE CURRENT AND DELINQUENT TAXES ON THE LANDS DESCRIBED WITHIN ARE
ENTERED
BY DEPU

RAMSEY
BY

EXHIBIT 2.
FINAL PLAT-RAMSEY COMMONS 2ND ADD.
CITY OF RAMSEY, MINNESOTA

001ACRA 6-29-93 # 425 $30.00

148TH LANE

15" RCP

15" RCP

PROPOSED
STORM SEWER
LOCATION
FES INV=861.6

15" RCP

Landscaping

INV=862.3
HEATER

18" RCP

18" RCP

BLOCK
WALL

WOOD
WALL

FENCE

860

862

864

866

868

870

NOWTHEN BOULEVARD

GERMANIUM STREET

DNR
WETLAND
658W

1

2

3

4

5

2

3

4

5

N

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SCALE IN FEET

EXHIBIT 3
148TH LANE ALTERNATIVE 1 STORM SEWER
CITY OF RAMSEY, MINNESOTA

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148TH LANE

NOWTHEN BOULEVARD

GERMANIUM STREET

15" RCP

15" RCP

15" RCP

18" RCP

18" RCP

INV=862.3

Landscaping

BLOCK WALL

WOOD WALL

FENCE

870

860

866

862

864

868

PROPOSED PERMANENT DRAINAGE EASEMENT

PROPOSED STORM SEWER LOCATION FES INV=861.4

DNR WETLAND 658W

1

2

3

4

5

2

3

4

5

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SCALE IN FEET

EXHIBIT 4
148TH LANE ALTERNATIVE 2 STORM SEWER

CITY OF RAMSEY, MINNESOTA

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TABLE 1
148TH LANE
ALTERNATIVE 1A - 15" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$500.00	1	$500
2	CLEARING	TREE	$100.00	12	$1,200
3	GRUBBING	TREE	$100.00	12	$1,200
4	REMOVE STORM SEWER	LIN FT	$5.00	118	$590
5	REMOVE CONCRETE CURB	LIN FT	$10.00	20	$200
6	REMOVE BITUMINOUS PAVEMENT	SQ YD	$5.00	23	$115
7	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	$3.00	40	$120
8	4" AGGREGATE BASE CLASS 5	SQ YD	$7.50	23	$173
9	4" BITUMINOUS PATCH	SQ YD	$28.00	23	$644
10	BULKHEAD MANHOLE	EACH	$500.00	1	$500
11	15" RC PIPE APRON	EACH	$300.00	1	$300
12	TRASH GUARD FOR 15" PIPE APRON	EACH	$150.00	1	$150
13	CONNECT TO EXISTING STORM SEWER	EACH	$1,000.00	1	$1,000
14	15" RC PIPE SEWER DESIGN 3006, CL V	LIN FT	$22.00	152	$3,344
15	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48 - 4020	EACH	$1,500.00	1	$1,500
16	CONCRETE CURB & GUTTER DESIGN B618	LIN FT	$20.00	20	$400
17	TRAFFIC CONTROL	LUMP SUM	$300.00	1	$300
18	CONIFEROUS TREE 4' HT B&B	TREE	$200.00	12	$2,400
19	TURF ESTABLISHMENT	ACRE	$1,500.00	0.1	$150

Estimated Construction Cost	$14,786
Contingency (10%)	$1,479
Total Estimated Construction Cost	$16,264

TABLE 2
148TH LANE
ALTERNATIVE 1B - 18" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$800.00	1	$800
2	CLEARING	TREE	$100.00	12	$1,200
3	GRUBBING	TREE	$100.00	12	$1,200
4	REMOVE STORM SEWER	LIN FT	$5.00	233	$1,165
5	REMOVE CONCRETE CURB	LIN FT	$10.00	135	$1,350
6	REMOVE BITUMINOUS PAVEMENT	SQ YD	$5.00	150	$750
7	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	$3.00	155	$465
8	4" AGGREGATE BASE CLASS 5	SQ YD	$7.50	150	$1,125
9	4" BITUMINOUS PATCH	SQ YD	$28.00	150	$4,200
10	BULKHEAD MANHOLE	EACH	$500.00	1	$500
11	18" RC PIPE APRON	EACH	$350.00	1	$350
12	TRASH GUARD FOR 18" PIPE APRON	EACH	$200.00	1	$200
13	CONNECT TO EXISTING STORM SEWER	EACH	$1,000.00	2	$2,000
14	18" RC PIPE SEWER DESIGN 3006, CL III	LIN FT	$23.00	267	$6,141
15	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48 - 4020	EACH	$1,500.00	1	$1,500
16	CONCRETE CURB & GUTTER DESIGN B618	LIN FT	$20.00	135	$2,700
17	TRAFFIC CONTROL	LUMP SUM	$500.00	1	$500
18	CONIFEROUS TREE 4' HT B&B	TREE	$200.00	12	$2,400
19	TURF ESTABLISHMENT	ACRE	$1,500.00	0.1	$150

Estimated Construction Cost	$28,696
Contingency (10%)	$2,870
Total Estimated Construction Cost	$31,566

TABLE 3
148TH LANE
ALTERNATIVE 1C - 24" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$1,300.00	1	$1,300
2	CLEARING	TREE	$100.00	12	$1,200
3	GRUBBING	TREE	$100.00	12	$1,200
4	REMOVE STORM SEWER	LIN FT	$4.00	388	$1,552
5	REMOVE CONCRETE CURB	LIN FT	$5.00	155	$775
6	REMOVE BITUMINOUS PAVEMENT	SQ YD	$5.00	195	$975
7	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	$3.00	175	$525
8	4" AGGREGATE BASE CLASS 5	SQ YD	$7.50	195	$1,463
9	4" BITUMINOUS PATCH	SQ YD	$28.00	195	$5,460
10	BULKHEAD MANHOLE	EACH	$500.00	1	$500
11	24" RC PIPE APRON	EACH	$450.00	2	$900
12	TRASH GUARD FOR 24" PIPE APRON	EACH	$300.00	2	$600
13	CONNECT TO EXISTING STORM SEWER	EACH	$1,000.00	1	$1,000
14	24" RC PIPE SEWER DESIGN 3006, CL III	LIN FT	$29.00	414	$12,006
15	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48 - 4020	EACH	$1,500.00	1	$1,500
16	CONSTRUCT DRAINAGE STRUCTURE DESIGN 60 - 4020	LIN FT	$2,000.00	2	$4,000
17	CONCRETE CURB & GUTTER DESIGN B618	LIN FT	$20.00	155	$3,100
18	TRAFFIC CONTROL	LUMP SUM	$500.00	1	$500
19	CONIFEROUS TREE 4' HT B&B	TREE	$200.00	12	$2,400
20	TURF ESTABLISHMENT	ACRE	$1,500.00	0.2	$300

Estimated Construction Cost	$41,256
Contingency (10%)	$4,126
Total Estimated Construction Cost	$45,381

TABLE 4
148TH LANE
ALTERNATIVE 2A - 15" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$400.00	1	$400
2	CLEARING	TREE	$100.00	2	$200
3	GRUBBING	TREE	$100.00	2	$200
4	REMOVE STORM SEWER	LIN FT	$5.00	118	$590
5	REMOVE CONCRETE CURB	LIN FT	$10.00	20	$200
6	REMOVE BITUMINOUS PAVEMENT	SQ YD	$5.00	23	$115
7	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	$3.00	40	$120
8	COMMON EXCAVATION	CU YD	$5.00	100	$500
9	4" AGGREGATE BASE CLASS 5	SQ YD	$7.50	23	$173
10	4" BITUMINOUS PATCH	SQ YD	$28.00	23	$644
11	BULKHEAD MANHOLE	EACH	$500.00	1	$500
12	15" RC PIPE APRON	EACH	$300.00	1	$300
13	TRASH GUARD FOR 15" PIPE APRON	EACH	$150.00	1	$150
14	CONNECT TO EXISTING STORM SEWER	EACH	$1,000.00	1	$1,000
15	15" RC PIPE SEWER DESIGN 3006, CL V	LIN FT	$22.00	152	$3,344
16	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48 - 4020	EACH	$1,500.00	1	$1,500
17	CONCRETE CURB & GUTTER DESIGN B618	LIN FT	$20.00	20	$400
18	TRAFFIC CONTROL	LUMP SUM	$300.00	1	$300
19	CONIFEROUS TREE 4' HT B&B	TREE	$200.00	2	$400
20	TURF ESTABLISHMENT	ACRE	$1,500.00	0.1	$150

Estimated Construction Cost	$11,186
Contingency (10%)	$1,119
Permanent Easement ($1.15/ sq ft)	$794
Total Estimated Construction Cost	$13,098

TABLE 5
148TH LANE
ALTERNATIVE 2B - 18" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$500.00	1	$500
2	CLEARING	TREE	$100.00	2	$200
3	GRUBBING	TREE	$100.00	2	$200
4	REMOVE STORM SEWER	LIN FT	$5.00	153	$765
5	REMOVE CONCRETE CURB	LIN FT	$10.00	55	$550
6	REMOVE BITUMINOUS PAVEMENT	SQ YD	$5.00	61	$305
7	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	$3.00	75	$225
8	COMMON EXCAVATION	CU YD	$5.00	100	$500
9	4" AGGREGATE BASE CLASS 5	SQ YD	$7.50	61	$458
10	4" BITUMINOUS PATCH	SQ YD	$28.00	61	$1,708
11	BULKHEAD MANHOLE	EACH	$500.00	1	$500
12	18" RC PIPE APRON	EACH	$350.00	1	$350
13	TRASH GUARD FOR 18" PIPE APRON	EACH	$200.00	1	$200
14	CONNECT TO EXISTING STORM SEWER	EACH	$1,000.00	2	$2,000
15	18" RC PIPE SEWER DESIGN 3006, CL III	LIN FT	$23.00	187	$4,301
16	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48 - 4020	EACH	$1,500.00	1	$1,500
17	CONCRETE CURB & GUTTER DESIGN B618	LIN FT	$20.00	55	$1,100
18	TRAFFIC CONTROL	LUMP SUM	$500.00	1	$500
19	CONIFEROUS TREE 4' HT B&B	TREE	$200.00	2	$400
20	TURF ESTABLISHMENT	ACRE	$1,500.00	0.1	$150

Estimated Construction Cost	$16,412
Contingency (10%)	$1,641
Permanent Easement ($1.15/ sq ft)	$794
Total Estimated Construction Cost	$18,846

TABLE 6
148TH LANE
ALTERNATIVE 2C - 24" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$900.00	1	$900
2	CLEARING	TREE	$100.00	2	$200
3	GRUBBING	TREE	$100.00	2	$200
4	REMOVE STORM SEWER	LIN FT	$4.00	306	$1,224
5	REMOVE CONCRETE CURB	LIN FT	$5.00	75	$375
6	REMOVE BITUMINOUS PAVEMENT	SQ YD	$5.00	106	$530
7	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	$3.00	95	$285
8	COMMON EXCAVATION	CU YD	$5.00	100	$500
9	4" AGGREGATE BASE CLASS 5	SQ YD	$7.50	106	$795
10	4" BITUMINOUS PATCH	SQ YD	$28.00	106	$2,968
11	BULKHEAD MANHOLE	EACH	$500.00	1	$500
12	24" RC PIPE APRON	EACH	$450.00	2	$900
13	TRASH GUARD FOR 24" PIPE APRON	EACH	$300.00	2	$600
14	CONNECT TO EXISTING STORM SEWER	EACH	$1,000.00	1	$1,000
15	24" RC PIPE SEWER DESIGN 3006, CL III	LIN FT	$29.00	334	$9,686
16	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48 - 4020	EACH	$1,500.00	1	$1,500
17	CONSTRUCT DRAINAGE STRUCTURE DESIGN 60 - 4020	LIN FT	$2,000.00	2	$4,000
18	CONCRETE CURB & GUTTER DESIGN B618	LIN FT	$20.00	75	$1,500
19	TRAFFIC CONTROL	LUMP SUM	$500.00	1	$500
20	CONIFEROUS TREE 4' HT B&B	TREE	$200.00	2	$400
21	TURF ESTABLISHMENT	ACRE	$1,500.00	0.2	$300

Estimated Construction Cost	$28,863
Contingency (10%)	$2,886
Permanent Easement ($1.15/ sq ft)	$794
Total Estimated Construction Cost	$32,543

TABLE 7
148TH LANE
ALTERNATIVE 3

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$500.00	1	$500
2	CLEARING	TREE	$100.00	10	$1,000
3	GRUBBING	TREE	$100.00	10	$1,000
4	COMMON EXCAVATION	CU YD	$5.00	270	$1,350
5	GRANULAR BORROW	CU YD	$8.00	1166	$9,328
6	TURF ESTABLISHMENT	ACRE	$1,500.00	0.5	$750

Estimated Construction Cost	$13,928
Contingency (10%)	$1,393
Total Estimated Construction Cost	$15,321

Section 2
149th Lane

149th Lane

Description

As shown on Exhibit 5, a low area exists on Lot 3, Block 1 of Ramsey Meadows 4th Addition. There is a drain tile that drains the low area to DNR Wetland 658W. During large storm events, DNR Wetland 658W backs up through the drain tile and into the low area. DNR Wetland 658W drains east under Trunk Highway 47 (TH 47) through a small weir structure and 15" pipe to DNR Wetland 659W. The weir structure is at an elevation of 860.9 and drains to the 15" pipe at an elevation of 860.0.

The current outlet elevation is approximately two feet above the bottom of Wetland 658W. The existing 100-year high water level (HWL) for DNR Wetland 658W is 862.1 and for DNR Wetland 659W is 860.4. As shown on Exhibit 6, there is an existing drainage and utility easement over a majority of Block 1 of Ramsey Meadows 4th Addition including the low area in question.

Alternatives

The following alternatives address the water elevation in DNR Wetland 658W.

Alternative 1
Alternative 1 will include removing the existing weir structure and leaving only the 15" culvert as the outlet from DNR Wetland 658W. By removing the weir structure, the wetland will begin to discharge at an elevation of 860.0 as opposed to 860.8.

Removing the weir structure, resulting in a lower normal water level in the wetland, will result in a 100-year HWL for DNR Wetland 658W of 862.0. The 100-year HWL for DNR Wetland 659W did not change. The estimated cost to remove the weir structure is $1,265. Table 8 includes the individual costs for this alternative.

It is our understanding that any work proposed below an elevation of 860 will need the approval of the Minnesota Department of Natural Resources (DNR). This alternative will not have any effect below an elevation of 860 and is not anticipated to need the approval of the DNR. It appears the weir structure is part of the TH 47 storm sewer system. Removing the weir structure may require Mn/DOT's approval.

Alternative 2
Alternative 2 will include removing the existing weir structure and constructing an additional outlet from DNR Wetland 658W under TH 47. The proposed additional outlet would be at the same elevation as the existing outlet, 860.0. It was assumed the additional pipe would have to be jacked under TH 47.

Three different sized additional outlet pipes were analyzed. The following table summarizes the 100-year HWL's for DNR Wetlands 658W and 659W and the estimated costs to construct each outlet pipe:

Outlet Pipe Size	100-Year HWL (658W)	100-Year HWL (659W)	Estimated Cost
Existing	862.1	860.4	N/A
Existing + 15"	861.8	861.2	$15,290
Existing + 18"	861.7	861.3	$18,755
Existing + 24"	861.6	861.4	$29,040

Tables 9 through 11 include the individual costs for this alternative.

As mentioned above, it is our understanding that any work proposed below an elevation of 860 will need the approval of the DNR. This alternative will not have any effect below an elevation of 860 and is not anticipated to need the approval of the DNR. Removing the weir structure and constructing a culvert under TH 47 will require Mn/DOT's approval.

Alternative 3

Alternative 3 will include removing the existing weir structure and constructing an additional outlet from DNR Wetland 658W under TH 47. The proposed additional outlet would be at an elevation of 859.0, one foot lower than the existing outlet. It was assumed the additional pipe would have to be jacked under TH 47.

Two different sized additional outlet pipes were analyzed. The following table summarizes the 100-year HWL's for DNR Wetlands 658W and 659W and the estimated costs to construct each outlet pipe:

Outlet Pipe Size	100-Year HWL (658W)	100-Year HWL (659W)	Estimated Cost
Existing	862.1	860.4	N/A
Existing + lower 18"	861.6	861.3	$18,755
Existing + lower 24"	861.6	861.5	$29,040

Tables 12 and 13 include the individual costs for this alternative.

As mentioned above, it is our understanding that any work proposed below an elevation of 860 will need the approval of the DNR. This alternative has work proposed below an elevation of 860 and will need the approval of the DNR. Removing the weir structure and constructing a culvert under Trunk Highway 47 will require Mn/DOT's approval.

Alternative 4

Alternative 4 will include filling the low area on Lot 3, Block 1 of Ramsey Meadows 4th Addition. Filling the low area will reduce the frequency of the backyard flooding. During large storm events, the area may be inundated by water, but will likely be less frequently and for a shorter duration than under existing conditions.

The estimated cost to fill the low area is $4,681. Table 14 includes the individual costs for this alternative.

As shown on Exhibits 7 and 8, this low area appears to have been designed as wetland mitigation area. Further research may be necessary to determine if this area is protected by the Wetland Conservation Act (WCA). If the area is protected by the WCA, filling this low area will not be a viable alternative.

RAMSEY MEADOWS
4TH ADDITION

4
WO
ELEV=863.5

3
WO
ELEV=864.8

2
WO
ELEV=863.8

1

149TH LANE

860
861
862
863
864
865
866
WALL
SHED
FENCE
DRAINTILE
9.75

DNR
WETLAND
658W

DNR
WETLAND
659W

INV=860.0
INV=859.3
15" RCP
OUTLET/WEIR
STRUCTURE
ELEV=860.8

TRUNK HIGHWAY 47

N

SCALE 30 0 30 60 IN FEET

EXHIBIT 5
149TH LANE EXISTING CONDITIONS

CITY OF RAMSEY, MINNESOTA

Feb 13, 2012 - 2:51pm
K:\cod_surv\Land Desktop 2008\RA432\dwg\RA432-EXHIBITS.dwg

OFFICIAL PLAT

RAMSEY MEADOWS 4TH ADDITION

CITY OF RAMSEY COUNTY OF ANOKA

pg 25

KNOW ALL PERSONS BY THESE PRESENTS: That J. A. Menkveld & Associates, Inc., a Minnesota corporation, owner and proprietor and Builders Mortgage Corporation, a Minnesota corporation, mortgagee of the following described property situated in the County of Anoka, State of Minnesota, to-wit:

That part of the Southwest Quarter of Section 24, Township 32, Range 25, Anoka County, Minnesota, described as follows:

Beginning at the northeast corner of Outlot A, RAMSEY MEADOWS 3RD ADDITION, according to the recorded plat thereof, Anoka County, Minnesota; thence South 89 degrees 07 minutes 51 seconds East, assumed bearing, parallel with the south line of said Southwest Quarter, a distance of 208.50 feet to the center line of State Trunk Highway No. 47, per the plat of AMBER RIDGE, according to the recorded plat thereof, Anoka County, Minnesota; thence northerly along said center line and along the center line of said State Trunk Highway No. 47, per the plat of WILLOW RIDGE, according to the recorded plat thereof, Anoka County, Minnesota, a distance of 789.96 feet to the intersection with the northeasterly extension of the following described line:

Beginning at a point on the center line of State Trunk Highway No. 47, per the plat of GORHAM'S ADDITION, according to the recorded plat thereof, Anoka County, Minnesota, said point being distant 93.00 feet southeasterly of the northeasterly extension of the southeasterly line of Block 3, said GORHAM'S ADDITION, as measured along said center line; thence South 64 degrees 18 minutes West, parallel with the southeasterly line of Block 3, said GORHAM'S ADDITION, a distance of 376.78 feet, and said line there terminating;

thence South 64 degrees 18 minutes 00 seconds West, along said last described line, a distance of 376.83 feet to the point of termination of said line; thence southwesterly along a tangential curve concave to the southeast, having a radius of 103.25 feet and a central angle of 63 degrees 14 minutes 20 seconds, a distance of 113.96 feet; thence South 1 degree 03 minutes 40 seconds West, tangent to said curve, a distance of 345.42 feet; thence southwesterly along a tangential curve concave to northwest, having a radius of 115.75 feet and a central angle of 60 degrees 08 minutes 15 seconds, a distance of 121.49 feet; thence South 61 degrees 11 minutes 55 seconds West, tangent to said curve, a distance of 53.09 feet to the intersection with the westerly extension of the north line of said Outlot A, RAMSEY MEADOWS 3RD ADDITION; thence South 87 degrees 06 minutes 09 seconds East, along said north line and its westerly extension, a distance of 517.62 feet to the point of beginning.

AND

Outlot A, RAMSEY MEADOWS 3RD ADDITION, according to the recorded plat thereof, Anoka County, Minnesota.

Have caused the same to be surveyed and platted as RAMSEY MEADOWS 4TH ADDITION and do hereby dedicate to the public for public use forever the boulevard, lane and drainage and utility easements as shown on the plat. In witness whereof said J. A. Menkveld & Associates, Inc., a Minnesota corporation, has caused these presents to be signed by its proper officer this 7th day of Oct, 1996. Also in witness whereof said Builders Mortgage Corporation has caused these presents to be signed by its proper officer this 7th day of Oct, 1996.

SIGNED:

J. A. MENKVELD & ASSOCIATES, INC.:

J. A. Menkveld, President

BUILDERS MORTGAGE CORPORATION:

Ronald Stratton, as President

STATE OF MINNESOTA) The foregoing instrument was acknowledged before me this
COUNTY OF Anoka) 7th day of October, 1996, by J. A. Menkveld, President of J. A. Menkveld & Associates, Inc., a Minnesota Corporation, on behalf of the Corporation.

TERESA VIVIE NOTARY PUBLIC-MINNESOTA ANOKA COUNTY MY COMMISSION EXP. 01/31/2000

Teresa Vivie
Notary Public, Anoka County, Minnesota
My Commission expires 1-31-00

STATE OF MINNESOTA) The foregoing instrument was acknowledged before me this
COUNTY OF Anoka) 4th day of October, 1996, by Ronald Stratton, President of Builders Mortgage Corporation, a Minnesota corporation, on behalf of the corporation.

KATHLEEN R CAVEN NOTARY PUBLIC MINNESOTA MY COMMISSION EXPIRES 01-31-00

Kathleen R. Caven
Notary Public, Ramsey County, Minnesota
My Commission expires 1-31-2000

I hereby certify that I have surveyed and platted the land described in the dedication on this plat as RAMSEY MEADOWS 4TH ADDITION; that the plat is a correct representation of said survey; that all distances are correctly shown on said plat in feet and hundredths of a foot; that the monuments have been correctly placed in the ground as shown; that the outside boundaries are correctly designated on said plat; and that there are no wetlands or public highways to be designated on said plat other than as shown thereon.

Jeffrey N. Caine, Registered Land Surveyor
Minnesota Registration No. 12251

STATE OF MINNESOTA) The surveyors certificate was acknowledged before me a Notary
COUNTY OF ANOKA) Public, this 15 day of October, 1996, by Jeffrey N. Caine, Land Surveyor.

JILL M KENT NOTARY - MINNESOTA ANOKA COUNTY MY COMM EXPIRES 1-31-00

Jill M Kent
Notary Public, Anoka County, Minnesota
My Commission expires 01-31-00

CITY OF RAMSEY

We hereby certify that the City Council of the City of Ramsey, Anoka County, Minnesota, duly accepted and approved the plat of RAMSEY MEADOWS 4TH ADDITION at a regular meeting held this 24th day of September, 1996. If applicable, the written comments and recommendations of the Commissioner of Transportation and the County Highway Engineer have been received by the city or the prescribed 30 day period has elapsed without receipt of such comments and recommendations, as provided by Minn. Statutes, Section 505.03, Subd. 2.

By _____ Mayor By Ryan Pichowsky Clerk

Checked and approved this 7th day of MAY, 1997.

By MERLYN D. ANDERSON
Anoka County Surveyor
by Larry D. Hein deputy

I HEREBY CERTIFY THAT THE CURRENT AND DELINQUENT TAXES ON THE LANDS DESCRIBED WITHIN ARE PAID AND THIS PLAT/OR IS
DATED May 7, 1997
PROPERTY TAX ADMINISTRATOR
BY J. Culver
DEPUTY PROPERTY TAX ADMINISTRATOR

1275655

OFFICE OF COUNTY RECORDER
STATE OF MINNESOTA, COUNTY OF ANOKA
I hereby certify that the within instrument was filed in this office for record on the 7th day of MAY, 1997 at 10:10 o'clock A.M., and was duly recorded in book 54 page 25

Edward M. Iruska
County
By KHQ
Deputy

CITY OF RAMSEY MUNICIPAL CORP. ANOKA COUNTY MINN.

CAINE & ASSOCIATES LAND SURVEYORS, INC.

DRAINAGE AND UTILITY EASEMENTS SHOWN THUS:

10 5 5 10

BEING 10 FEET WIDE AND ADJOINING ALL STREET RIGHT-OF-WAY LINES AND REAR LOT LINES AND 5 FEET WIDE AND ADOINING ALL SIDE LOT LINES, UNLESS OTHERWISE SHOWN ON THE PLAT.

N

SCALE IN FEET
0 100 200 300
SCALE: 1 INCH = 100 FEET

- DENOTES IRON MONUMENT FOUND.
- DENOTES 1/2 INCH IRON PIPE SET.
- DENOTES ANOKA COUNTY MONUMENT.

NOTE: FOR THE PURPOSES OF THIS PLAT, THE SOUTH LINE OF THE SW1/4 OF SEC. 24, T. 32, R. 25 IS ASSUMED TO BEAR S 89°07'51"E

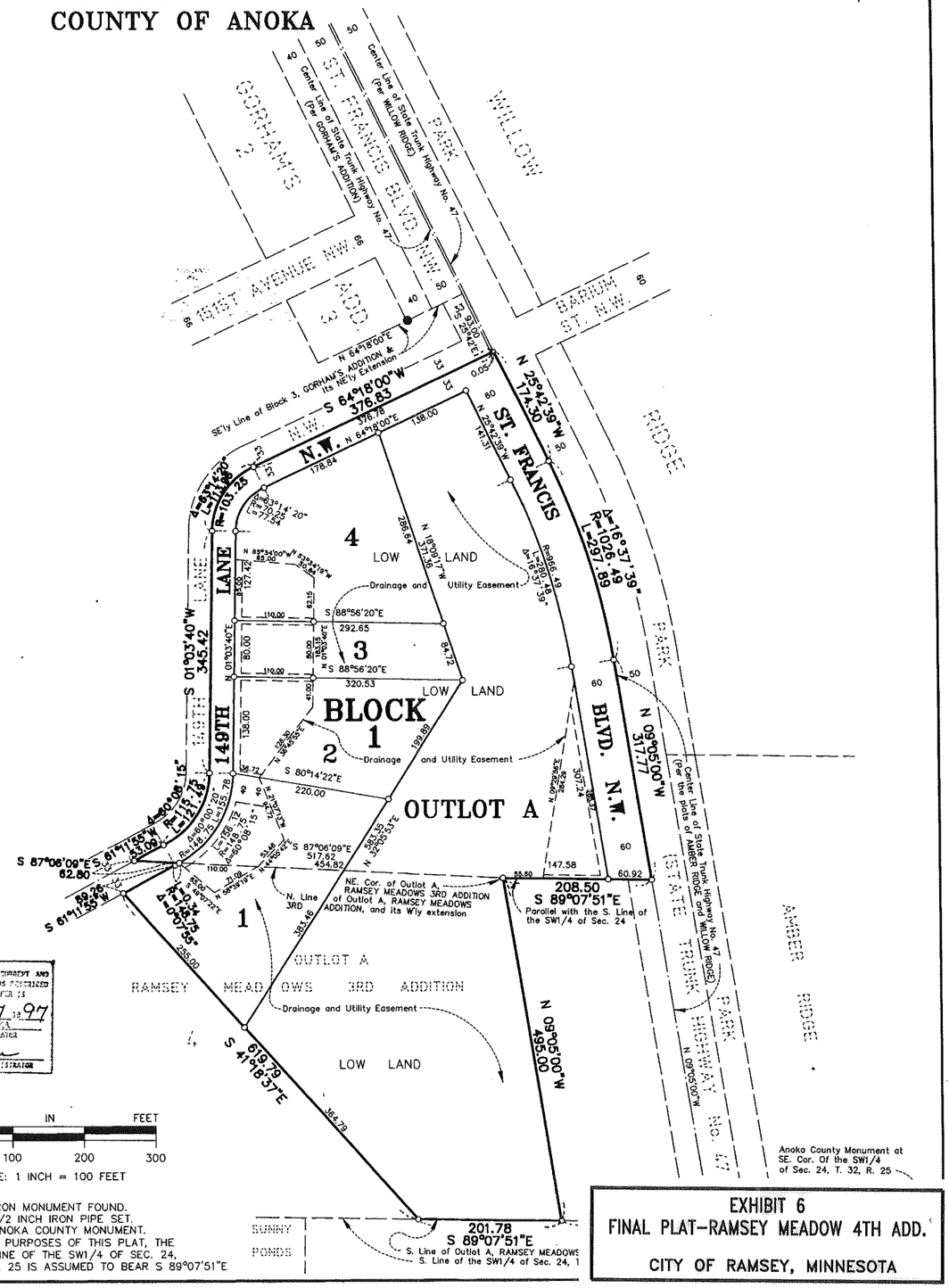
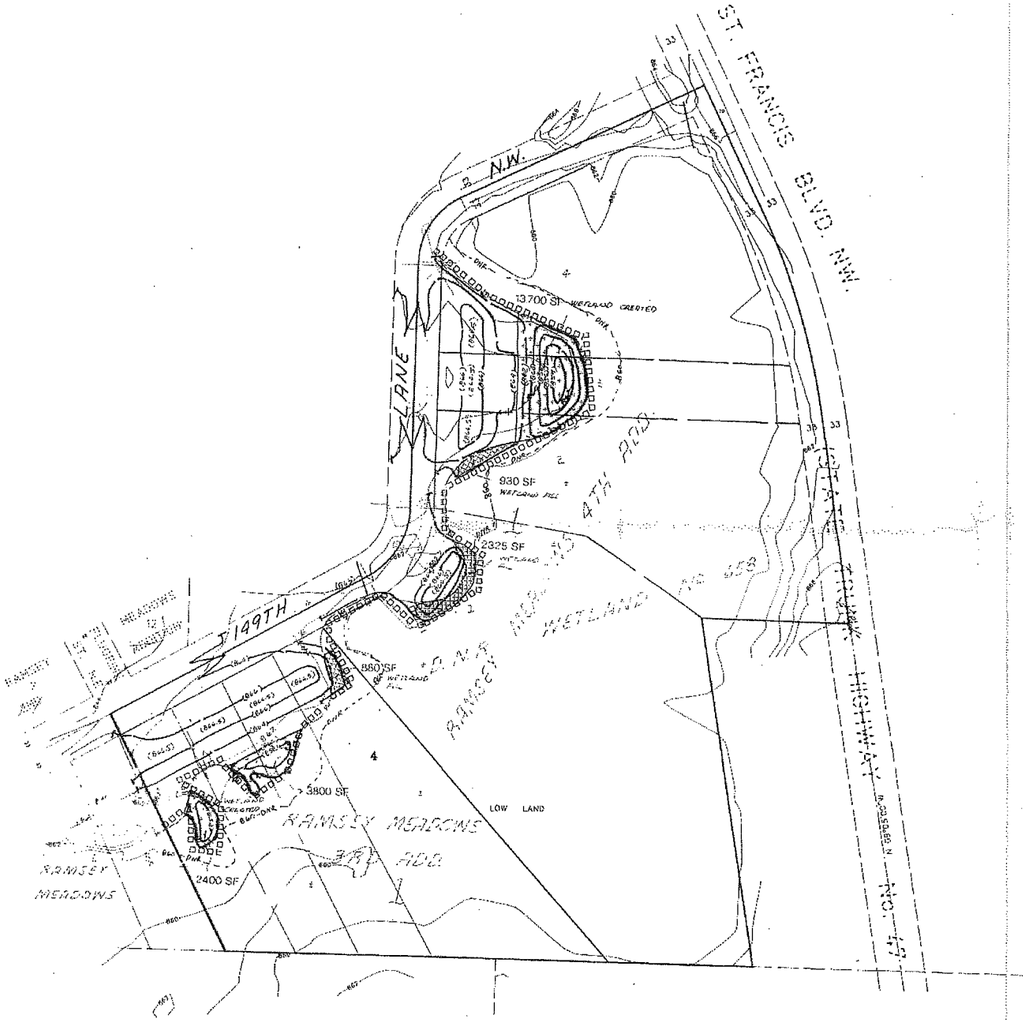


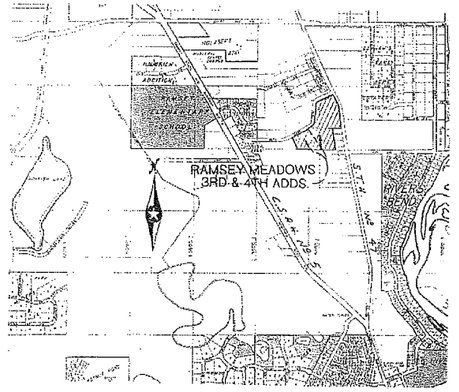
EXHIBIT 6
FINAL PLAT-RAMSEY MEADOW 4TH ADD.
CITY OF RAMSEY, MINNESOTA

30997/$245.00

PRELIMINARY GRADING, DRAINAGE & EROSION CONTROL PLAN FOR:

RAMSEY MEADOWS 3RD & 4TH ADDITIONS





EROSION CONTROL DURING CONSTRUCTION

NOTES:

1. All disturbed soils within 100 lineal feet from wetlands shall be covered with four inches (4") of topsoil and seeded with a minimum of seventy-five (75) pounds per acre of MN/DOT Specification Section 3876, Mixture No. 12, with fertilizer 12-12-12 mixture applied at 600 pounds per acre with Mulch-Type 1. This work shall be constructed in accordance with MN/DOT Specification Section 2575, within the following timeframe:

   Slopes steeper than 3:1 - 7 days
   Slopes 10:1 to 3:1 - 14 days
   Flatter than 10:1 - 21 days

2. Excavate ponding areas before upland grading.

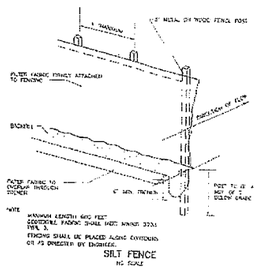
3. The bottom of all drainage ditches shall be stabilized within 100 feet of all wetlands. Stabilization must be initiated within 24 hours of connection to wetlands and be completed within five days. All pipes connecting to drainage swales must be provided with energy dissipation structures prior to connecting to wetland.

4. Sediment control structures must be in place prior to starting of grading and must be maintained until final stabilization has been established.

5. Inspect and maintain after rainfall (as required). The inspector is to be

6. Vehicle tracking onto unpaved surfaces must be minimized.

7. All silt fence shall be removed after the site has undergone final stabilization.



SILT FENCE
NO SCALE

	PROPOSED NON-DNR WETLAND DISTURBED	PROPOSED WETLAND CREATED
Ramsey Meadows 3rd Addition	880 S.F. ±	6,200 S.F. ±
Ramsey Meadows 4th Addition	4,135 S.F. ±	19,900 S.F. ±
TOTALS	5,015 S.F. ±	26,100 S.F. ±

I HEREBY CERTIFY THAT THIS SURVEY, PLAN OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MINNESOTA.

J. Gary M. Caine

DATE Jan. 23, 1995 REG. NO. 12251

x 000.0	DENOTES EXISTING SPOT ELEVATION
(000.0)	" PROPOSED " "
—— 000 ——	" EXISTING CONTOUR
—— (000) ——	" PROPOSED CONTOUR
----DNR----	DENOTES EDGE OF D.N.R. WETLAND NO 6SB.
—W—W—	DENOTES EDGE OF WETLAND AS LOCATED BY JOHN C. ANDERSON OF WETLANDS DATA, INC. & SURVEYED BY CAINE & ASSOC. LAND SURVEYORS, INC.
□□□□□□□□□□□□□□	DENOTES PROPOSED SILT FENCE

SCALE IN FEET
0 100 200 300
SCALE: 1 INCH = 100 FEET

● DENOTES IRON MONUMENT FOUND
○ DENOTES 1/2 INCH IRON PIPE SET.
BEARINGS SHOWN ARE BASED ON ASSUMED DATUM

CAINE & ASSOCIATES
LAND SURVEYORS, INC.
17720 Highway 65 N.E. – Ham Lake
434-7646

EXHIBIT 7
RAMSEY MEADOWS GRADING PLAN

CITY OF RAMSEY, MINNESOTA

RAMSEY MEADOWS 2ND ADDITION

CITY OF RAMSEY — COUNTY OF ANOKA

PRELIMINARY PLAT AND WETLAND MITIGATION PLAN

OWNER AND SUBDIVIDER: Gilbert A. Henkveld
207 E. Main St.
Box 547
Anoka, MN 55303

LAND SURVEYOR AND DESIGNER: Caine and Associates Land Surveyers, Inc.
17720 Hwy 65 N.E.
Ham Lake, MN 55304
434-7946

TOTAL AREA: 26.5 acres, more or less

PROPOSED USE: 83 Lots for R-1, U, Single Family Urban Residential, 4 outlots and 1 Park (Walkway) in two phases.

PROPOSED DENSITY: 1.8 Lots per acre

PROPOSED WATER SOURCE AND SEWAGE DISPOSAL: City water and sewer

EXISTING ZONING: R-1 Residential

MINIMUM BUILDING SET BACKS: Front = 35
Side House = 10
Side Garage = 5
Side Corner = 20 or line up with existing homes
Rear = 35

DRAINAGE AND UTILITY EASEMENTS: 10 feet wide adjoining all street lines and rear lot lines, and 5 feet wide adjoining all side lot lines, unless otherwise indicated on the plat.

DATE OF PREPARATION: 1982

Proposed Legal Description:

That part of the SW1/4 of Section 24, Township 32, Range 25, in Anoka County, Minnesota, described as follows: Beginning at a point on the South line of said SW1/4, said point being a distance of 175 feet, as measured along said South line, Westerly of the West right of way line of State Trunk Highway No. 47 as it is now laid out and travelled; thence North 9 degrees 04 minutes 41 seconds West on a line parallel to said West right of way line a distance of 295 feet; thence North 85 degrees 56 minutes 06 seconds West a distance of 516.09 feet; thence South 61 degrees 11 minutes 55 seconds West a distance of 656.98 feet; thence Southwesterly on a curve to the right having a radius of 434.27 feet a distance of 225.07 feet; thence North 69 degrees 45 minutes 25 seconds West on a line parallel to the South line of said SW1/4 a distance of 55.31 feet; thence Southerly and parallel to the West line of said SW1/4 a distance of 1277.57 feet to a point on the South line of said SW1/4, said point being 600 feet East of the Southwest corner of said SW1/4 as measured along the south line; thence Easterly on said South line a distance of 1277.57 feet to the point of beginning.

And that part of the Southwest Quarter of Section 24, Township 32, Range 25 in Anoka County, Minnesota described as follows: Commencing at the intersection of the South line of said Southwest Quarter and the center line of State Trunk Highway No. 47 as it is now laid out and travelled; thence North 9 degrees 04 minutes 41 seconds West on said center line a distance of 282.97 feet; thence of beginning of land to be described; thence North 7 degrees 58 minutes 10 seconds West on said center line a distance of 282.97 feet; thence Northwesterly along said center line on a curve to the left having a radius of 1036.48 feet, a distance of 320.64 feet; thence North 25 degrees 42 minutes West on said center line a distance of 189.24 feet to a point which is 91 feet Southeasterly as measured along said center line, from the Northeasterly extension of the Southeasterly line of Block 3 in Gorham's Addition; thence South 64 degrees 18 minutes West on a line parallel to the Southeasterly line of said Block 3 a distance of 276.78 feet; thence Southwesterly on a curve to the left having a radius of 303.25 feet a distance of 113.55 feet; thence South 1 degree 03 minutes 40 seconds West a distance of 368.42 feet; thence Southwesterly on a curve to the right having a radius of 315.75 feet a distance of 221.93 feet; thence South 61 degrees 11 minutes 55 seconds West a distance of 53.09 feet; thence South 85 degrees 56 minutes 06 seconds West a distance of 516.09 feet; thence Easterly on a line parallel to the South line of said Southwest Quarter a distance of 208.40 feet to the point of beginning.

And that part of the Southwest Quarter of Section 24, Township 32, Range 25, in Anoka County, Minnesota, described as follows:

Commencing at a point on the center line of State Trunk Highway Number 47 as it is now laid out and travelled, said point being 93 feet Southeasterly as measured along said center line from the Northeasterly extension of the Southeasterly line of Block 3 in GORHAM'S ADDITION; thence South 64 degrees 18 minutes West on a line parallel to the Southeasterly line of said Block 3 a distance of 276.78 feet; thence Southeasterly on a curve to the left having a radius of 303.25 feet a distance of 113.90 feet; thence South 1 degree 03 minutes 40 seconds West a distance of 345.62 feet; thence Southwesterly on a curve to the right having a radius of 315.75 feet a distance of 121.89 feet; thence South 61 degrees 11 minutes 55 seconds West a distance of 206.09 feet to a point, hereinafter known as Point A; thence North 1 degree 03 minutes 40 seconds East a distance of 830.42 feet to a point which is 260 feet Southeasterly of, as measured at right angles to, the Northwesterly extension of the Northwesterly line of said Block 3, said point being the point of beginning of land to be described; thence returning South 1 degree 30 minutes 40 seconds West a distance 534.62 feet more or less to said point A; thence South 61 degrees 11 minutes 55 seconds West a distance of 223.04 feet; thence Southwesterly on a curve to the right having a radius of 434.27 feet a distance of 77.71 feet to a point 600 feet East of the West line of said Southwest Quarter as measured parallel with the South line of said Southwest Quarter; thence Northerly and parallel with the West line of said Southwest Quarter to a point which is 635.8 feet North of the South line of said Southwest Quarter as measured parallel with the South line of said Southwest Quarter; thence Easterly and parallel with the South line of said Southwest Quarter a distance of 600 feet to the West line of said Southwest Quarter; thence Northerly along the West line of said Southwest Quarter and to a point, said point being 531.05 feet Southerly of the intersection of the Southeasterly extension of the center line of 152nd Avenue Northeast in said GORHAM'S ADDITION with the West line of said Southwest Quarter, said 531.05 feet being measured along the West line of said Southwest Quarter; thence Easterly at right angles to the West line of said Southwest Quarter a distance of 160 feet; thence Northerly at right angles a distance of 272.26 feet; thence Westerly at right angles a distance of 20 feet to a point which is 140 feet East of the West line of said Southwest Quarter, as measured at right angles to said West line; thence Northerly and parallel with said West line to a point, said point being 275.3 feet Southerly of the Southeasterly extension of the Southeasterly line of 152nd Avenue NW, in GORHAM'S ADDITION, as measured parallel with the West line of said Southwest Quarter; thence Easterly at right angles a distance of 280 feet; thence Northerly at right angle to a point, said point being 311 feet Southerly said Southeasterly extension of the Southeasterly line of 152nd Avenue NW., said 311 feet being measured parallel with the West line of said Southwest Quarter; thence Easterly at right angles to an intersection with a line drawn South 15 degrees 52 minutes 56 seconds East from a point on said Southeasterly extension of the Southeasterly line of 152nd Avenue NW, said point on said Southeasterly extension being distant 431 feet Northeasterly as measured at right angles to the West line of said Southwest Quarter; thence South 15 degrees 52 minutes 56 seconds East to an intersection with line 'A', said line A being described as follows:

Commencing at the Northwest corner of Lot 1, Block 3, GORHAM'S ADDITION; thence South 64 degrees 18 minutes West on the Southeasterly line of 151st Avenue NW. in said GORHAM'S ADDITION extended Southwesterly for a distance of 470 feet; thence Northwesterly on a curve to the right having a radius of 101 feet for a distance of 141.02 feet; thence North 35 degrees 42 minutes West for a distance of 21.98 feet to the actual point of beginning of the line to be described; thence South 45 degrees 18 minutes West for a distance of 240.88 feet, more or less, to the aforementioned point of intersection and there terminating; thence South 15 degrees 51 minutes 49 seconds East to an intersection with a line drawn through the point of beginning parallel with the Southwesterly extension of the Northeasterly line of said Block 3 in GORHAM'S ADDITION; thence to the point of beginning.

Excepting therefrom all that part of the above described tract which lies Southerly of a line drawn parallel with and 33 feet Northerly of the following described line:

Beginning at the aforementioned point 'A'; thence South 61 degrees 11 minutes 55 seconds West for a distance of 233.04 feet, thence Southwesterly on a curve to the right having a radius of 434.27 feet for a distance of 77.71 feet and there terminating, said parallel line being lengthened or shortened as necessary to intersect the boundaries of the above described tract.

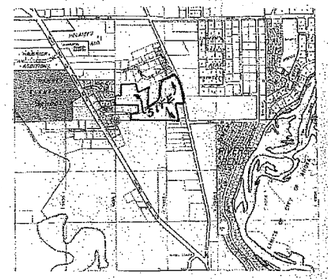
And also except:

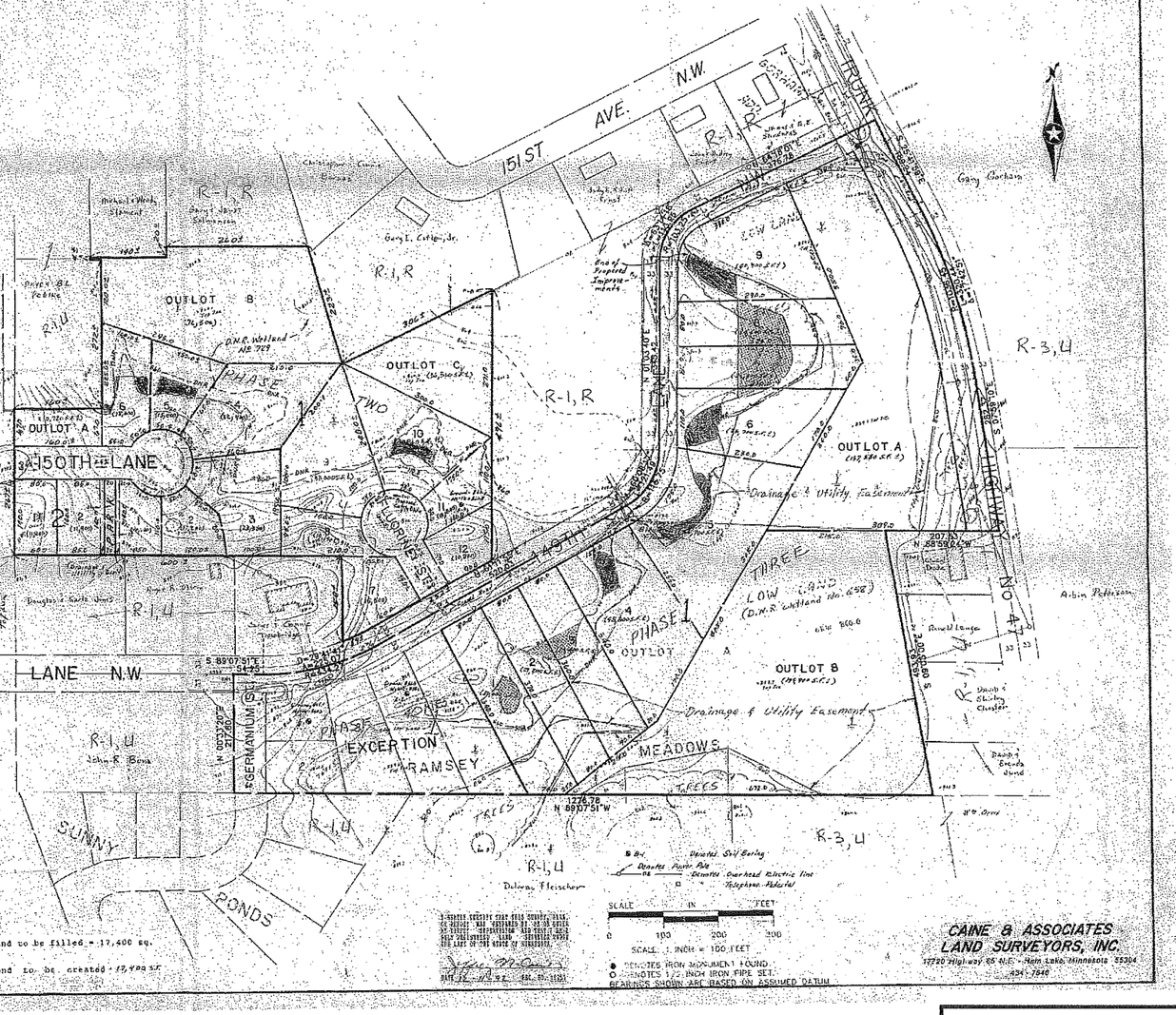
Lots 1 through 5, Block 1, RAMSEY MEADOWS, according to the recorded plat thereof, Anoka County, Minnesota;

And also except:

That part of Germanium Street N.W. and 149TH Lane N.W. as dedicated in said plat of RAMSEY MEADOWS.

VICINITY MAP





Note: Area of non - D.N.R. wetland to be filled = 17,400 sq. ft.

Area of proposed new wetland to be created = 17,400 s.f.

CAINE & ASSOCIATES
LAND SURVEYORS, INC.
17720 Highway 65 N.E. - Ham Lake, Minnesota 55304
434-7946

EXHIBIT 8
RAMSEY MEADOWS WETLAND MITIGATION PLAN
CITY OF RAMSEY, MINNESOTA

TABLE 8
149TH LANE
ALTERNATIVE 1

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$100.00	1	$100
2	REMOVE STORM STRUCTURE	EACH	$400.00	1	$400
3	15" RC PIPE APRON	EACH	$300.00	1	$300
4	CONNECT TO EXISTING STORM SEWER	EACH	$300.00	1	$300
5	TURF ESTABLISHMENT	LUMP SUM	$50.00	1	$50

Estimated Construction Cost	$1,150
Contingency (10%)	$115
Total Estimated Construction Cost	$1,265

TABLE 9
149TH LANE
ALTERNATIVE 2A - 15" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$400.00	1	$400
2	REMOVE STORM STRUCTURE	EACH	$400.00	1	$400
3	15" RC PIPE APRON	EACH	$300.00	3	$900
4	15" RC PIPE SEWER DESIGN 3006, CL V - JACKED	LIN FT	$100.00	118	$11,800
5	CONNECT TO EXISTING STORM SEWER	EACH	$300.00	1	$300
6	TURF ESTABLISHMENT	LUMP SUM	$100.00	1	$100

Estimated Construction Cost	$13,900
Contingency (10%)	$1,390
Total Estimated Construction Cost	$15,290

TABLE 10
149TH LANE
ALTERNATIVE 2B - 18" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$500.00	1	$500
2	REMOVE STORM STRUCTURE	EACH	$400.00	1	$400
3	15" RC PIPE APRON	EACH	$300.00	1	$300
4	18" RC PIPE APRON	EACH	$350.00	2	$700
5	18" RC PIPE SEWER DESIGN 3006, CL V - JACKED	LIN FT	$125.00	118	$14,750
6	CONNECT TO EXISTING STORM SEWER	EACH	$300.00	1	$300
7	TURF ESTABLISHMENT	LUMP SUM	$100.00	1	$100

Estimated Construction Cost	$17,050
Contingency (10%)	$1,705
Total Estimated Construction Cost	$18,755

TABLE 11
149TH LANE
ALTERNATIVE 2C - 24" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$800.00	1	$800
2	REMOVE STORM STRUCTURE	EACH	$400.00	1	$400
3	15" RC PIPE APRON	EACH	$300.00	1	$300
4	24" RC PIPE APRON	EACH	$450.00	2	$900
5	24" RC PIPE SEWER DESIGN 3006, CL V - JACKED	LIN FT	$200.00	118	$23,600
6	CONNECT TO EXISTING STORM SEWER	EACH	$300.00	1	$300
7	TURF ESTABLISHMENT	LUMP SUM	$100.00	1	$100

Estimated Construction Cost	$26,400
Contingency (10%)	$2,640
Total Estimated Construction Cost	$29,040

TABLE 12
149TH LANE
ALTERNATIVE 3A - 18" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$500.00	1	$500
2	REMOVE STORM STRUCTURE	EACH	$400.00	1	$400
3	15" RC PIPE APRON	EACH	$300.00	1	$300
4	18" RC PIPE APRON	EACH	$350.00	2	$700
5	18" RC PIPE SEWER DESIGN 3006, CL V - JACKED	LIN FT	$125.00	118	$14,750
6	CONNECT TO EXISTING STORM SEWER	EACH	$300.00	1	$300
7	TURF ESTABLISHMENT	LUMP SUM	$100.00	1	$100

Estimated Construction Cost	$17,050
Contingency (10%)	$1,705
Total Estimated Construction Cost	$18,755

TABLE 13
149TH LANE
ALTERNATIVE 3B - 24" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$800.00	1	$800
2	REMOVE STORM STRUCTURE	EACH	$400.00	1	$400
3	15" RC PIPE APRON	EACH	$300.00	1	$300
4	24" RC PIPE APRON	EACH	$450.00	2	$900
5	24" RC PIPE SEWER DESIGN 3006, CL V - JACKED	LIN FT	$200.00	118	$23,600
6	CONNECT TO EXISTING STORM SEWER	EACH	$300.00	1	$300
7	TURF ESTABLISHMENT	LUMP SUM	$100.00	1	$100

Estimated Construction Cost	$26,400
Contingency (10%)	$2,640
Total Estimated Construction Cost	$29,040

TABLE 14
149TH LANE
ALTERNATIVE 4

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$100.00	1	$100
2	COMMON EXCAVATION	CU YD	$5.00	133	$665
3	GRANULAR BORROW	CU YD	$8.00	380	$3,040
4	TURF ESTABLISHMENT	ACRE	$1,500.00	0.3	$450

Estimated Construction Cost	$4,255
Contingency (10%)	$426
Total Estimated Construction Cost	$4,681

Section 3
Rum River Hills Golf Club

Rum River Hills Golf Club

Summary

Rum River Hills Golf Club has recently experienced flooding on some fairways and cart paths. Exhibit 9 shows the discharge points and problem areas throughout the golf course. The following will address the problem areas throughout the golf course.

Flooding along Hole #1

The first area of concern includes flooding of the large pond along Hole #1. This pond discharges through an existing concrete outlet structure and a 12" plastic pipe to the east. The outlet is labeled as Area 1 on Exhibit 9. It is our understanding that after large storm events, the pond remains elevated for long periods of time. The 100-year high water level (HWL) is 870.3.

After reviewing video recordings of the outlet pipe, it appears that the pipe has several sags in it and several joints have been compromised. The outlet pipe is relatively shallow and may have been affected by frost heave. This outlet pipe is likely causing the pond to operate inefficiently.

We believe that the best alternative for this outlet is to remove the existing outlet structure and the 12" outlet pipe and replace them with a new 4-foot diameter concrete outlet structure and 18" high density polyethylene pipe outlet in the same location as the existing pipe. Exhibit 10 shows the proposed outlet structure. The new pipe would be installed at a lower elevation than it exists now, reducing the impact of frost heave on the pipe. The polyethylene pipe is also more rigid and is solid (no air voids) and therefore more resistant to frost heave or buoyancy when soils are saturated. A removable, weir wall would be installed in the new outlet structure. We would propose to leave the weir height at the same elevation as existing. By installing the weir wall, it will allow for greater flexibility in controlling the water elevations of the pond. Installing this outlet structure would result in a 100-year HWL of 870.0.

The estimated cost to construct the new outlet pipe and structure is $29,853. Table 15 includes the individual costs for this alternative.

Cart path flooding near the clubhouse

Based on the HWL of the pond along Hole #1, it appears that there could be an issue with the cart paths flooding near the clubhouse, Areas 2A and 2B on Exhibit 9. The existing culverts under the cart paths are a 15" diameter and 12" diameter. If flooding the cart paths is an issue, the best alternative would be to install larger diameter culverts under the cart paths.

Installing 24" diameter culverts will reduce the flooding during small storm events. However, since the HWL elevation for the area is controlled by the downstream outlet structure discussed above, the paths will still flood during large storm events. To reduce the flooding during the large storm events, the cart paths would have to be raised

approximately 1.5 feet. This would, however, increase the HWL in the pond near the clubhouse, which would appear to adversely affect the fairway for Hole #18.

The estimated cost to replace the two culverts under the carts paths is $6,642. Table 16 includes the individual costs this alternative.

Saturated soil along Hole #15

Another issue is occurring along Hole #15 near the Rum River. The soil in the area is saturated. There is an existing rock dam, Area 3 on Exhibit 19, southeast of the most saturated area of the fairway. Part of the fairway was excavated to help to determine the problem and drain the area.

Based on our review, it appears that the water being contained by the rock dam may be infiltrating into the soil and causing the saturation. There is a dropped of approximately seven feet from the rock dam to the bottom of the downstream channel. We also noticed that the existing drain tile that was excavated along Hole #15 was plugged with roots and soil.

We recommend two alternatives to address the soil saturation along Hole #15. First, the drain tile should be replaced to improve the drainage in the area. Second, the area of the creek that is being contained by the rock dam should be lined with an impermeable material to eliminate the water infiltrating through the soil. Lining the creek will eliminate the infiltration into the soil and the new drain tile will help to keep the existing soil dry.

The estimated cost to replace the drain tile and line the creek bed is $13,530. Table 17 includes individual costs for this alternative.

Flooding of Hole #3 and #17

Flooding of Hole #3 and #17 is also an issue at the golf course. The stormwater drains south through three 15" culverts, labeled Area 4A, Area 4B and Area 4C on Exhibit 9, and then to the Rum River.

One alternative to lower the HWL's in the area would be to install bigger culverts. A 21" culvert was modeled to replace the culverts at Area 4A and 4B and a 24" culvert was modeled to replace the culvert at 4C. The following table summarizes the 100-year HWL's for the three areas:

Existing 100-Year HWL			Proposed 100-Year HWL		
Area 4A	Area 4B	Area 4C	Area 4A	Area 4B	Area 4C
859.3	859.3	858.5	859.1	858.7	858.3

The estimated cost to replace the three culverts is $4,990. Table 18 includes individual costs for this alternative.

EXHIBIT 9
RUM RIVER HILLS GOLF CLUB
EXISTING CONDITIONS
CITY OF RAMSEY, MINNESOTA

Feb 14, 2012 - 9:28am
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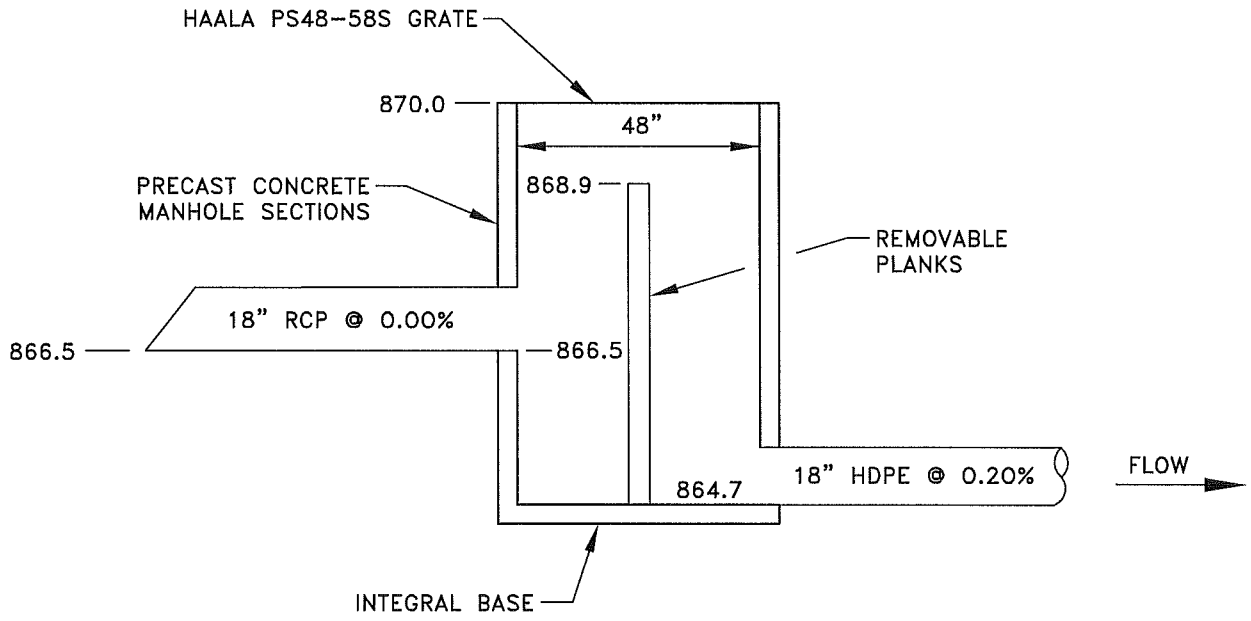

EXHIBIT 10
RUM RIVER HILLS GOLF CLUB
PROPOSED OUTLET STRUCTURE
CITY OF RAMSEY, MINNESOTA

Feb 14, 2012 - 11:42am
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TABLE 15
RUM RIVER HILLS GOLF CLUB
FLOODING AROUND HOLE #1 - NEW OUTLET STRUCTURE

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$800.00	1	$800
2	CLEARING	ACRE	$1,500.00	0.2	$300
3	GRUBBING	ACRE	$1,500.00	0.2	$300
4	REMOVE STORM SEWER	LIN FT	$1.50	856	$1,284
5	18" METAL APRON	EACH	$275.00	1	$275
6	18" RC PIPE APRON	EACH	$350.00	1	$350
7	18" HDPE PIPE SEWER	LIN FT	$22.00	850	$18,700
8	18" RC PIPE SEWER DESIGN 3006, CL III	LIN FT	$23.00	10	$230
9	OUTLET CONTROL STRUCTURE	EACH	$4,000.00	1	$4,000
10	TURF ESTABLISHMENT	ACRE	$1,500.00	0.6	$900

Estimated Construction Cost	$27,139
Contingency (10%)	$2,714
Total Estimated Construction Cost	$29,853

TABLE 16
RUM RIVER HILLS GOLF CLUB
CART PATH FLOODING NEAR CLUBHOUSE - NEW CULVERTS

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$200.00	1	$200
2	REMOVE STORM SEWER	LIN FT	$4.00	96	$384
3	REMOVE BITUMINOUS PAVEMENT	SQ YD	$5.00	30	$150
4	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	$3.00	48	$144
5	4" AGGREGATE BASE CLASS 5	SQ YD	$8.00	30	$240
6	4" BITUMINOUS PAVEMENT	SQ YD	$34.00	30	$1,020
7	24" METAL APRON	EACH	$325.00	4	$1,300
8	24" CP PIPE CULVERT	LIN FT	$25.00	96	$2,400
9	TURF ESTABLISHMENT	LUMP SUM	$200.00	1	$200

Estimated Construction Cost	$6,038
Contingency (10%)	$604
Total Estimated Construction Cost	$6,642

TABLE 17
RUM RIVER HILLS GOLF CLUB
HOLE #15 SATURATION - CREEK LINING AND DRAIN TILE

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$350.00	1	$350
2	4" PERF PIPE DRAIN	LIN FT	$15.00	450	$6,750
3	CREEK LINING	LUMP SUM	$5,000.00	1	$5,000
4	TURF ESTABLISHMENT	LUMP SUM	$200.00	1	$200

Estimated Construction Cost	$12,300
Contingency (10%)	$1,230
Total Estimated Construction Cost	$13,530

TABLE 18
RUM RIVER HILLS GOLF CLUB
FLOODING AROUND HOLE #3 AND #17 - NEW CULVERTS

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$200.00	1	$200
2	REMOVE STORM SEWER	LIN FT	$4.00	72	$288
3	21" METAL APRON	EACH	$300.00	4	$1,200
4	24" METAL APRON	EACH	$325.00	2	$650
5	24" CP PIPE CULVERT	LIN FT	$26.00	46	$1,196
6	24" CP PIPE CULVERT	LIN FT	$27.00	26	$702
7	TURF ESTABLISHMENT	LUMP SUM	$300.00	1	$300

Estimated Construction Cost	$4,536
Contingency (10%)	$454
Total Estimated Construction Cost	$4,990

Section 4
163rd Lane

163rd Lane

Description

As shown on Exhibit 11, a low area exists south of 163rd Lane and east of Wolfram Street. The low area does not have a piped outlet to County Ditch #3. During a majority of the year, stormwater runoff infiltrates into the soil. However, during early spring when the ground is frozen and during periods of heavy rainfall, water levels have risen to levels that cause flooding of adjacent properties.

Alternatives

The following alternatives address the water elevation in the low area.

Alternative 1
In this alternative, an outlet pipe would be installed from the low area to County Ditch #3, as shown on Exhibit 12. The outlet pipe will not be installed at the bottom of the low area, rather, it will be installed at an elevation that would allow smaller storm events to continue to infiltrate into the soil. The outlet pipe invert is proposed at an elevation of 872.0, which is the approximate elevation of a 3-inch rainfall event. The following table summarizes the 100-year HWL's, the detention time above an elevation of 873.0 and estimated costs to construct each outlet pipe:

Outlet Pipe Size	100-Year HWL	Detention Time Above Elevation 873 During a 100-Year Storm Event (hours)	Estimated Cost
Existing	874.8	23.4	N/A
12"	874.3	6.2	$68,640
15"	874.0	2.9	$74,305
18"	873.8	1.5	$80,795

As shown, the area may continue to flood during large storm events; however, the duration of flooding will be much shorter.

Tables 19 through 21 include the individual costs for this alternative. It is proposed to directionally drill the pipe as shown on Exhibit 12 as opposed to open cutting a trench. A trench would require excessive cuts in the surrounding area. The outlet pipe will be approximately 700 feet long. Cleaning the pipe will require access on both ends of the pipe.

Alternative 2
Alternative 2 included draining the low area east to a ditch system in Elmcrest Park. This alternative was reviewed and deemed not feasible. There is not enough difference in elevation from the low area to the ditch in Elmcrest Park.

Alternative 3

Alternative 3 included constructing a pipe west and then south along 163rd Lane and Wolfram Street to County Ditch #3. The length of this alternative is approximately 500 feet longer than Alternative 1, therefore decreasing the pipe slope and increasing the costs. The impact of constructing the pipe along the existing streets would also add to the costs of this alternative. For these reasons, this alternative was deemed not feasible.

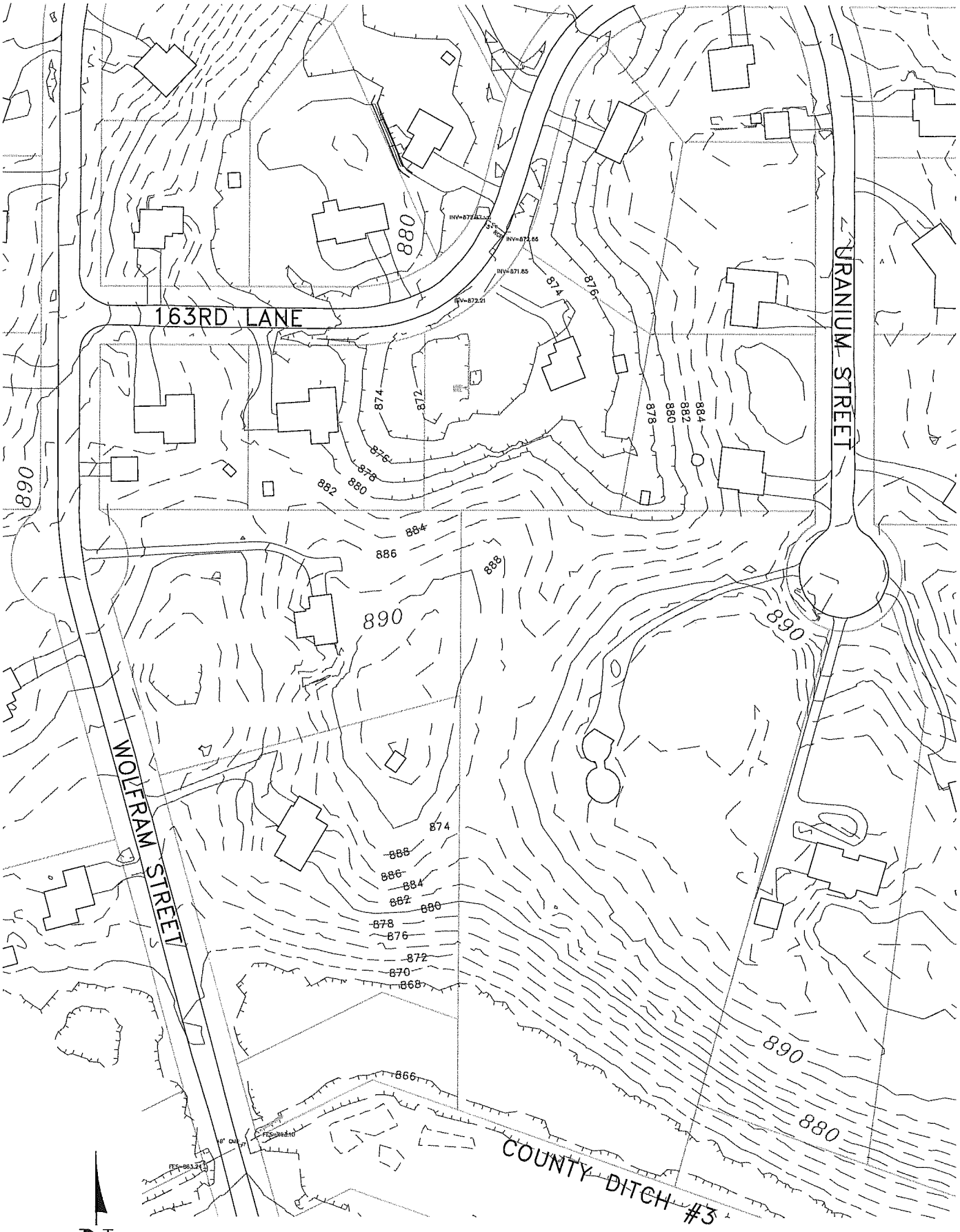

EXHIBIT 11
163RD LANE EXISTING CONDITIONS

CITY OF RAMSEY, MINNESOTA

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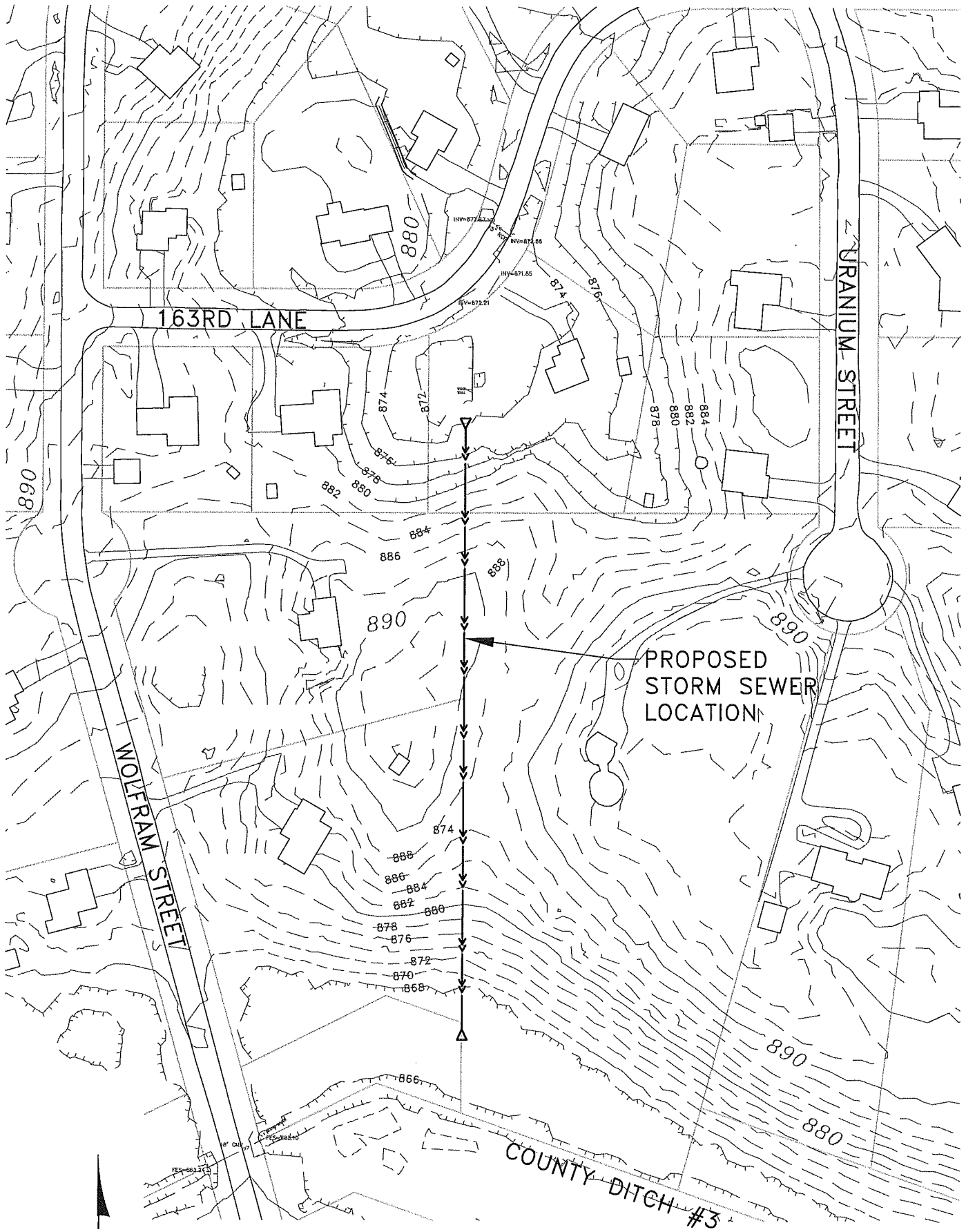

EXHIBIT 12
163RD LANE PROPOSED STORM SEWER

CITY OF RAMSEY, MINNESOTA

Feb 12, 2012 - 9:45am
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TABLE 19
163RD LANE
ALTERNATIVE 1A - 12" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$1,800.00	1	$1,800
2	COMMON EXCAVATION	CU YD	$5.00	100	$500
3	12" METAL APRON	EACH	$200.00	2	$400
4	12" HDPE PIPE SEWER (DIRECTIONALLY DRILLED)	LIN FT	$85.00	700	$59,500
5	TURF ESTABLISHMENT	LUMP SUM	$200.00	1	$200

Estimated Construction Cost	$62,400
Contingency (10%)	$6,240
Total Estimated Construction Cost	$68,640

TABLE 20
163RD LANE
ALTERNATIVE 1B - 15" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$2,000.00	1	$2,000
2	COMMON EXCAVATION	CU YD	$5.00	100	$500
3	15" METAL APRON	EACH	$225.00	2	$450
4	15" HDPE PIPE SEWER (DIRECTIONALLY DRILLED)	LIN FT	$92.00	700	$64,400
5	TURF ESTABLISHMENT	LUMP SUM	$200.00	1	$200

Estimated Construction Cost	$67,550
Contingency (10%)	$6,755
Total Estimated Construction Cost	$74,305

TABLE 21
163RD LANE
ALTERNATIVE 1C - 18" OUTLET

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$2,200.00	1	$2,200
2	COMMON EXCAVATION	CU YD	$5.00	100	$500
3	18" METAL APRON	EACH	$275.00	2	$550
4	18" HDPE PIPE SEWER (DIRECTIONALLY DRILLED)	LIN FT	$100.00	700	$70,000
5	TURF ESTABLISHMENT	LUMP SUM	$200.00	1	$200

Estimated Construction Cost	$73,450
Contingency (10%)	$7,345
Total Estimated Construction Cost	$80,795

Section 5
156th Lane

156th Lane

Description

As shown on Exhibit 13, a low area exists south of 156th Lane and west of Yakima Street, referred to Depression 1 on Exhibit 13. Depression 1 drains south and east through an existing storm sewer system to another low area west of Juniper Ridge Drive, referred to as Depression 2 on Exhibit 13. From Depression 2 the stormwater drains north through an existing storm sewer system to the Rum River. The outlet elevations for both Depression 1 and Depression 2 are 859.8.

During storm events, water ponds in the backyard of 5220 156th Lane. The area where water ponds was platted with a 75-foot drainage and utility easement, however, this easement has been vacated. The existing 100-year high water level (HWL) for Depression 1 is 864.7.

Alternatives

The following alternatives address the stormwater in the area.

Alternative 1
Alternative 1 includes filling the backyard of 5220 156th Lane. Excavation would be required in Woodland Green Park to the south to compensate for the storage being lost by filling the backyard. The proposed grading is shown on Exhibit 14. In this alternative the proposed 100-year HWL would remain 864.7, but it would not encroach into the backyard to the extent it does under existing conditions.

The estimated cost for this alternative is $21,175. Table 22 includes the individual costs for this alternative.

Alternative 2
Alternative 2 also includes filling the backyard of 5220 156th Lane and excavating Woodland Green Park to the south to compensate for the storage being lost by filling the backyard. As opposed to Alternative 1, this alternative proposes to over-excavate the area in Woodland Green Park, which will lower the 100-year HWL by adding storage. The proposed grading is shown on Exhibit 15. In this alternative the proposed 100-year HWL would drop to 864.1.

The estimated cost for this alternative is $76,274. Table 23 includes the individual costs for this alternative.

Alternative 3
Alternative 3 includes constructing an additional 12" outlet pipe from Depression 2. As shown on Exhibit 16, the new outlet pipe would run east along 156th Lane and then north along Juniper Ridge Drive to an existing catch basin that drains to the Rum River. The

new outlet would be constructed at an elevation of 857.8, two feet lower than the existing outlet.

The following table summarizes the 100-year HWL's for Depression 1, assuming the pond construction shown on Exhibit 14, and Depression 2:

Location	100-year HWL
Depression 1 – Existing	864.7
Depression 1 – Proposed	864.6
Depression 2 – Existing	866.0
Depression 2 – Proposed	865.9

The following table summarizes the 100-year HWL's for Depression 1, assuming the pond construction shown on Exhibit 15, and Depression 2:

Location	100-year HWL
Depression 1 – Existing	864.7
Depression 1 – Proposed	864.0
Depression 2 – Existing	866.0
Depression 2 – Proposed	865.8

As shown, adding this additional outlet pipe has very little effect on the high water levels of the two depressions. One reason for this is that the storm sewer system downstream of Depression 2 is at or above capacity and is flowing back into Depression 2 prior to draining downstream.

The estimated cost to construct this additional outlet pipe is $158,609. Table 24 includes the individual costs for this alternative.

Alternative 4

Alternative 4 includes constructing an additional 18" outlet pipe from Depression 1. As shown on Exhibit 16, the new outlet pipe would run east from Depression 1 to Depression 2. The new outlet would be constructed at an elevation of 858.2; 1.6-feet lower than the existing outlet. This alternative assumes that the new outlet from Depression 2, as discussed in Alternative 3, would also be constructed.

The following table summarizes the 100-year HWL's for Depression 1, assuming the pond construction shown on Exhibit 14, and Depression 2:

Location	100-year HWL
Depression 1 – Existing	864.7
Depression 1 – Proposed	864.6
Depression 2 – Existing	866.0
Depression 2 – Proposed	865.5

The following table summarizes the 100-year HWL's for Depression 1, assuming the pond construction shown on Exhibit 15, and Depression 2:

Location	100-year HWL
Depression 1 – Existing	864.7
Depression 1 – Proposed	863.8
Depression 2 – Existing	866.0
Depression 2 – Proposed	865.3

As shown, adding this additional outlet pipe has very little effect on the high water levels of the two depressions. After adding the pipe, stormwater actually flows from Depression 2 back to Depression 1 prior to flowing downstream, lowering the HWL in Depression 2.

The estimated cost to construct this additional outlet pipe is $37,697. Table 25 includes the individual costs for this alternative.

Alternative 5

Alternative 5 includes constructing a 36" outlet pipe from Depression 2. As shown on Exhibit 16, the new outlet pipe would run east from Depression 2 to the Rum River. The new outlet would be constructed at an elevation of 857.8. As part of this alternative, the existing outlet pipe from Depression 2 will be eliminated. This alternative also assumes that the new outlet from Depression 1, as discussed in Alternative 4, would also be constructed.

The following table summarizes the 100-year HWL's for Depression 1, assuming the pond construction shown on Exhibit 14, and Depression 2:

Location	100-year HWL
Depression 1 – Existing	864.7
Depression 1 – Proposed	863.8
Depression 2 – Existing	866.0
Depression 2 – Proposed	859.9

The following table summarizes the 100-year HWL's for Depression 1, assuming the pond construction shown on Exhibit 15, and Depression 2:

Location	100-year HWL
Depression 1 – Existing	864.7
Depression 1 – Proposed	862.7
Depression 2 – Existing	866.0
Depression 2 – Proposed	859.8

As shown, adding this outlet pipe has a significant effect on the high water levels of the two depressions. This alternative would have to be approved by the Minnesota Department of Natural Resources.

The estimated cost to construct this additional outlet pipe is $142,772. Table 26 includes the individual costs for this alternative.

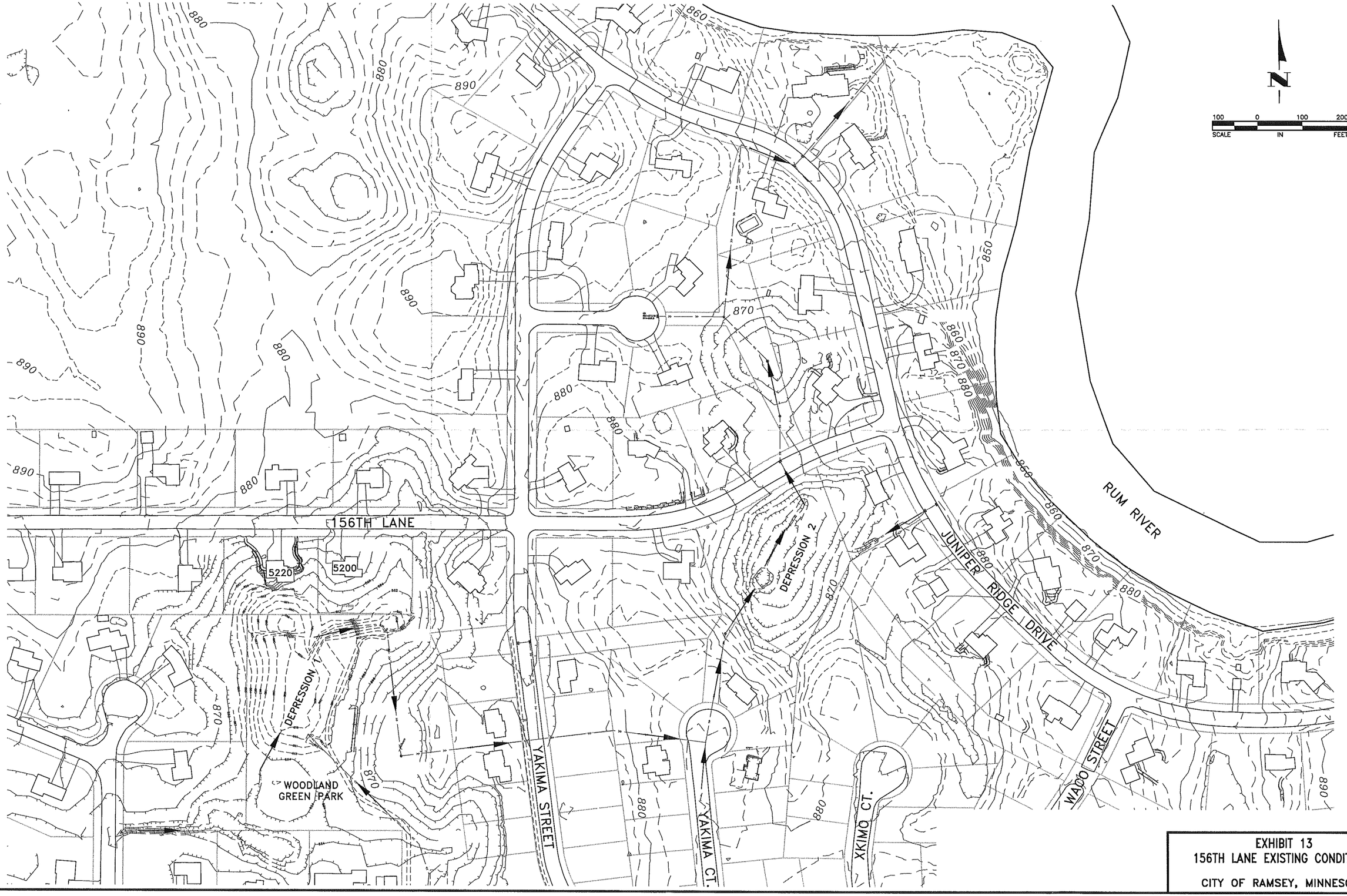

EXHIBIT 13
156TH LANE EXISTING CONDITIONS

CITY OF RAMSEY, MINNESOTA

Feb 13, 2012 - 5:14pm
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156TH LANE

5220

5200

DEPRESSION 1

WOODLAND GREEN PARK

Fence

FES=857.47

INV=859.23

15" RCP

INV=859.76

SKIMMER
HIGH=863.48
LOW=862.74
BTM=858.89

FES=858.77

FES=859.89

18" PVC

21" RCP

STORM MH
RIM=872.02
INV=859.52

N

30 0 30 60
SCALE IN FEET

EXHIBIT 14
156TH LANE ALTERNATIVE 1 GRADING PLAN
CITY OF RAMSEY, MINNESOTA

Feb 13, 2012 - 6:14pm
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156TH LANE

5220

5200

DEPRESSION 1

FES=857.41

INV=859.23

INV=859.76

SUMMER
PROH=863.48
LOW=862.74
BTM=855.89

FES=858.77

FES=859.89

CB
RIM=872.65
INV E=868.00

12" RCP

CB
RIM=872.66
INV W=868.74
INV S=868.52

15" RCP

18" RCP

WOODLAND
GREEN
PARK

STORM MH
RIM=872.02
INV=859.52

YAKIMA STREET

COBALT STREET

BARIUM STREET

155TH LANE

N

50 0 50 100
SCALE IN FEET

EXHIBIT 15
156TH LANE ALTERNATIVE 2 GRADING PLAN

CITY OF RAMSEY, MINNESOTA

Feb 13, 2012 - 6:14pm
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N

100 0 100 200
SCALE IN FEET

ALTERNATIVE 3 & 4
PROPOSED STORM
SEWER LOCATION

ALTERNATIVE 5
PROPOSED STORM
SEWER LOCATION

ALTERNATIVE 4 & 5
PROPOSED STORM
SEWER LOCATION

156TH LANE

5220

5200

DEPRESSION 1

DEPRESSION 2

WOODLAND
GREEN PARK

YAKIMA STREET

YAKIMA CT.

YKIMO CT.

JUNIPER RIDGE DRIVE

WADO STREET

RUM RIVER

890 880 860 870 850

EXHIBIT 16
156TH LANE PROPOSED STORM SEWER

CITY OF RAMSEY, MINNESOTA

Feb 14, 2012 - 10:33am
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TABLE 22
156TH LANE
ALTERNATIVE 1

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$600.00	1	$600
2	CLEARING	ACRE	$1,500.00	0.75	$1,125
3	GRUBBING	ACRE	$1,500.00	0.75	$1,125
4	COMMON EXCAVATION	CU YD	$5.00	1820	$9,100
5	ADJUST SEWER MANHOLES	LUMP SUM	$4,000.00	1	$4,000
6	ADJUST SEWER CLEANOUTS	LUMP SUM	$500.00	1	$500
7	REINSTALL SPRINKLER SYSTEM	LUMP SUM	$1,000.00	1	$1,000
8	TURF ESTABLISHMENT	ACRE	$1,500.00	1.2	$1,800

Estimated Construction Cost	$19,250
Contingency (10%)	$1,925
Total Estimated Construction Cost	$21,175

TABLE 23
156TH LANE
ALTERNATIVE 2

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$1,900.00	1	$1,900
2	CLEARING	ACRE	$1,500.00	2.35	$3,525
3	GRUBBING	ACRE	$1,500.00	2.35	$3,525
4	COMMON EXCAVATION	CU YD	$5.00	10123	$50,615
5	ADJUST SEWER MANHOLES	LUMP SUM	$4,000.00	1	$4,000
6	ADJUST SEWER CLEANOUTS	LUMP SUM	$500.00	1	$500
7	REINSTALL SPRINKLER SYSTEM	LUMP SUM	$1,000.00	1	$1,000
8	TURF ESTABLISHMENT	ACRE	$1,500.00	2.9	$4,275

Estimated Construction Cost	$69,340
Contingency (10%)	$6,934
Total Estimated Construction Cost	$76,274

TABLE 24
156TH LANE
ALTERNATIVE 3

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$4,200.00	1	$4,200
2	SALVAGE STORM SEWER	LIN FT	$20.00	72	$1,440
3	REMOVE MANHOLE	EACH	$500.00	1	$500
4	REMOVE BITUMINOUS PAVEMENT	SQ YD	$2.00	3,290	$6,580
5	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	$3.00	100	$300
6	4" AGGREGATE BASE CLASS 5	SQ YD	$7.00	3,290	$23,030
7	4" BITUMINOUS PAVEMENT	SQ YD	$21.00	3,290	$69,090
8	BITUMINOUS CURB	LIN FT	$3.00	1,850	$5,550
9	CONNECT TO EXISTING STORM SEWER	EACH	$1,000.00	2	$2,000
10	12" RC PIPE SEWER DESIGN 3006, CL V	LIN FT	$22.00	925	$20,350
11	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48 - 4020	EACH	$2,000.00	3	$6,000
12	TRAFFIC CONTROL	LUMP SUM	$5,000.00	1	$5,000
13	TURF ESTABLISHMENT	ACRE	$1,500.00	0.1	$150

Estimated Construction Cost	$144,190
Contingency (10%)	$14,419
Total Estimated Construction Cost	$158,609

TABLE 25
156TH LANE
ALTERNATIVE 4

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$1,000.00	1	$1,000
2	SALVAGE STORM SEWER	LIN FT	$20.00	120	$2,400
3	REMOVE CONCRETE CURB	LIN FT	$10.00	60	$600
4	REMOVE MANHOLE	EACH	$500.00	1	$500
5	REMOVE BITUMINOUS PAVEMENT	SQ YD	$5.00	110	$550
6	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	$3.00	70	$210
7	4" AGGREGATE BASE CLASS 5	SQ YD	$7.50	110	$825
8	4" BITUMINOUS PAVEMENT	SQ YD	$28.00	110	$3,080
9	18" RC PIPE APRON	EACH	$350.00	1	$350
10	TRASH GUARD FOR 18" PIPE APRON	EACH	$200.00	1	$200
11	CONNECT TO EXISTING STORM SEWER	EACH	$1,000.00	1	$1,000
12	18" RC PIPE SEWER DESIGN 3006, CL III	LIN FT	$23.00	735	$16,905
13	CONSTRUCT DRAINAGE STRUCTURE DESIGN 48 - 4020	EACH	$1,500.00	2	$3,000
14	CONCRETE CURB AND GUTTER DESIGN B618	LIN FT	$20.00	60	$1,200
15	TRAFFIC CONTROL	LUMP SUM	$2,000.00	1	$2,000
16	TURF ESTABLISHMENT	ACRE	$1,500.00	0.3	$450

Estimated Construction Cost	$34,270
Contingency (10%)	$3,427
Total Estimated Construction Cost	$37,697

TABLE 26
156TH LANE
ALTERNATIVE 5

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$3,750.00	1	$3,750
2	REMOVE STORM SEWER	LIN FT	$4.00	72	$288
3	BULKHEAD MANHOLE	EACH	$500.00	1	$500
4	36" METAL APRON	EACH	$325.00	1	$325
5	36" RC PIPE APRON	EACH	$450.00	1	$450
6	TRASH GUARD FOR 36" PIPE APRON	EACH	$400.00	1	$400
7	36" RC PIPE SEWER DESIGN 3006, CL III	LIN FT	$38.00	110	$4,180
8	36" HDPE PIPE SEWER (DIRECTIONALLY DRILLED)	LIN FT	$280.00	420	$117,600
9	CONSTRUCT DRAINAGE STRUCTURE DESIGN 60 - 4020	LIN FT	$2,000.00	1	$2,000
10	TURF ESTABLISHMENT	ACRE	$1,500.00	0.2	$300

Estimated Construction Cost	$129,793
Contingency (10%)	$12,979
Total Estimated Construction Cost	$142,772

Section 6
Sodium Street

Sodium Street

Description

The house at 16756 Sodium Street has been experiencing water in the basement. Exhibit 17 shows the existing area. One reason for water in the basement could be that stormwater fills the ditch on the east side of Sodium Street, overtops the road and if the driveway culvert is blocked, the water fills up the ditch on the west side of Sodium Street and drains toward the house. The water then seeps along the basement wall and eventually into the basement. Another reason for water in the basement may be due to a high groundwater elevation in the area.

Alternatives

The following alternatives address the issue of water entering the basement from the road ditch.

Alternative 1

Alternative 1 will include installing a culvert under Sodium Street, regrading the west ditch of Sodium Street, constructing a berm to keep the water in the ditch, and replacing the existing driveway culvert. The ditch would be graded to drain to the south property line of 16756 Sodium Street and a culvert would be installed to drain the stormwater to the swale on the west side of the lot. Exhibit 18 shows the proposed construction. The culvert along the south property line is needed since a ditch cannot be graded without impacting the existing septic drainfield.

To be able to install the pipe along the south property line to the swale on the west side of the lot, a utility pole and a utility pedestal will have to be relocated from the southeast corner of 16756 Sodium Street. Moving the utilities will allow the area to be graded as needed to construct the ditch and the culvert. Regrading the ditch will prevent the stormwater from draining toward the house and reducing the chances of having water in the basement.

The estimated cost for this alternative is $12,225. Table 27 includes the individual costs for this alternative.

Alternative 2

Alternative 2 is similar to Alternative 1, but instead of installing a culvert along the south property line to the swale, a retaining wall would be constructed. This alternative would only be required if the utilities in the southeast corner of the lot were unable to be relocated.

The estimated cost for this alternative is $18,847. Table 28 includes the individual costs for this alternative.

Both alternatives would require that the property owner give an easement along the south property line. Also, temporary easements will likely be required to grade the ditch and construct the berm on the west side of Sodium Street.

SODIUM STREET

INV=876.21
12" CMP
INV=875.99

WOOD WALL
INV=875.02

GFE= 873.38
CONC
WELL

GFE= 876.96
CONC
12" RCP
INV=875.39

BLOCK WALL
CONC
16756
873.72 WO

CONTROL BOX

Septic manhole

FENCE

3' Hedge

SEPTIC MOUND

WOOD WALL
INV=876.45
12" CMP
WOOD WALL
INV=876.33
CONC

FENCE

P-OH

N

25 0 25 50
SCALE IN FEET

EXHIBIT 17
SODIUM STREET EXISTING CONDITIONS
CITY OF RAMSEY, MINNESOTA

Feb 13, 2012 - 1:42pm
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SODIUM STREET

CREATE BERM

REGRADE DITCH

CREATE BERM

REGRADE DITCH

DAYLIGHT DITCH

PROPOSED
12" CULVERT

PROPOSED
15" CULVERT

INV=876.21
12" CMP
INV=875.99

INV=875.02

GFE=873.38
CONC
WELL

GFE=
876.96
CONC

BLOCK
WALL
CONC
16756
873.72 WO

CONTROL
BOX

Septic
manhole

3' Hedge

FENCE

WOOD
WALL

INV=876.45
12" CMP
INV=876.33

CONC

SEPTIC
MOUND

SEPTIC
MOUND

FENCE

P-OH

HO-d

N

25 0 25 50
SCALE IN FEET

EXHIBIT 18
SODIUM STREET PROPOSED CONSTRUCTION

CITY OF RAMSEY, MINNESOTA

Feb 13, 2012 - 1:53pm
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TABLE 27
SODIUM STREET
ALTERNATIVE 1

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$300.00	1	$300
2	REMMOVE STORM SEWER	LIN FT	$5.00	25	$125
3	REMOVE CONCRETE PAVEMENT	SQ YD	$6.00	45	$270
4	REMOVE BITUMINOUS PAVEMENT	SQ YD	$5.00	49	$245
5	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	$3.00	44	$132
6	COMMON EXCAVATION	CU YD	$6.00	400	$2,400
7	4" AGGREGATE BASE CLASS 5	SQ YD	$7.50	94	$705
8	4" BITUMINOUS PAVEMENT	SQ YD	$28.00	49	$1,372
9	4" CONCRETE DRIVEWAY PAVEMENT	SQ YD	$13.00	45	$585
10	15" METAL APRON	EACH	$225.00	2	$450
11	12" RC PIPE APRON	EACH	$275.00	4	$1,100
12	15" CP PIPE SEWER	LIN FT	$20.00	44	$880
13	12" RC PIPE SEWER DESIGN 3006, CL V	LIN FT	$20.00	40	$800
14	TRAFFIC CONTROL	LUMP SUM	$1,000.00	1	$1,000
15	TURF ESTABLISHMENT	ACRE	$1,500.00	0.5	$750

Estimated Construction Cost	$11,114
Contingency (10%)	$1,111
Total Estimated Construction Cost	$12,225

TABLE 28
SODIUM STREET
ALTERNATIVE 2

ITEM NO.	DESCRIPTION	UNIT	UNIT COST	TOTAL ESTIMATED QUANTITY	TOTAL ESTIMATED COST
1	MOBILIZATION	LUMP SUM	$300.00	1	$300
2	REMMOVE STORM SEWER	LIN FT	$5.00	25	$125
3	REMOVE CONCRETE PAVEMENT	SQ YD	$6.00	45	$270
4	REMOVE BITUMINOUS PAVEMENT	SQ YD	$5.00	49	$245
5	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	$3.00	44	$132
6	COMMON EXCAVATION	CU YD	$6.00	475	$2,850
7	4" AGGREGATE BASE CLASS 5	SQ YD	$7.50	94	$705
8	4" BITUMINOUS PAVEMENT	SQ YD	$28.00	49	$1,372
9	4" CONCRETE DRIVEWAY PAVEMENT	SQ YD	$13.00	45	$585
10	12" RC PIPE APRON	EACH	$275.00	4	$1,100
11	12" RC PIPE SEWER DESIGN 3006, CL V	LIN FT	$20.00	40	$800
12	MODULAR BLOCK RETAINING WALL	SQ FT	$23.00	300	$6,900
13	TRAFFIC CONTROL	LUMP SUM	$1,000.00	1	$1,000
14	TURF ESTABLISHMENT	ACRE	$1,500.00	0.5	$750

Estimated Construction Cost	$17,134
Contingency (10%)	$1,713
Total Estimated Construction Cost	$18,847