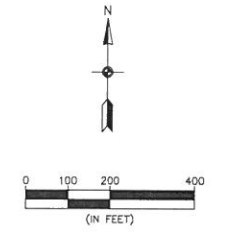
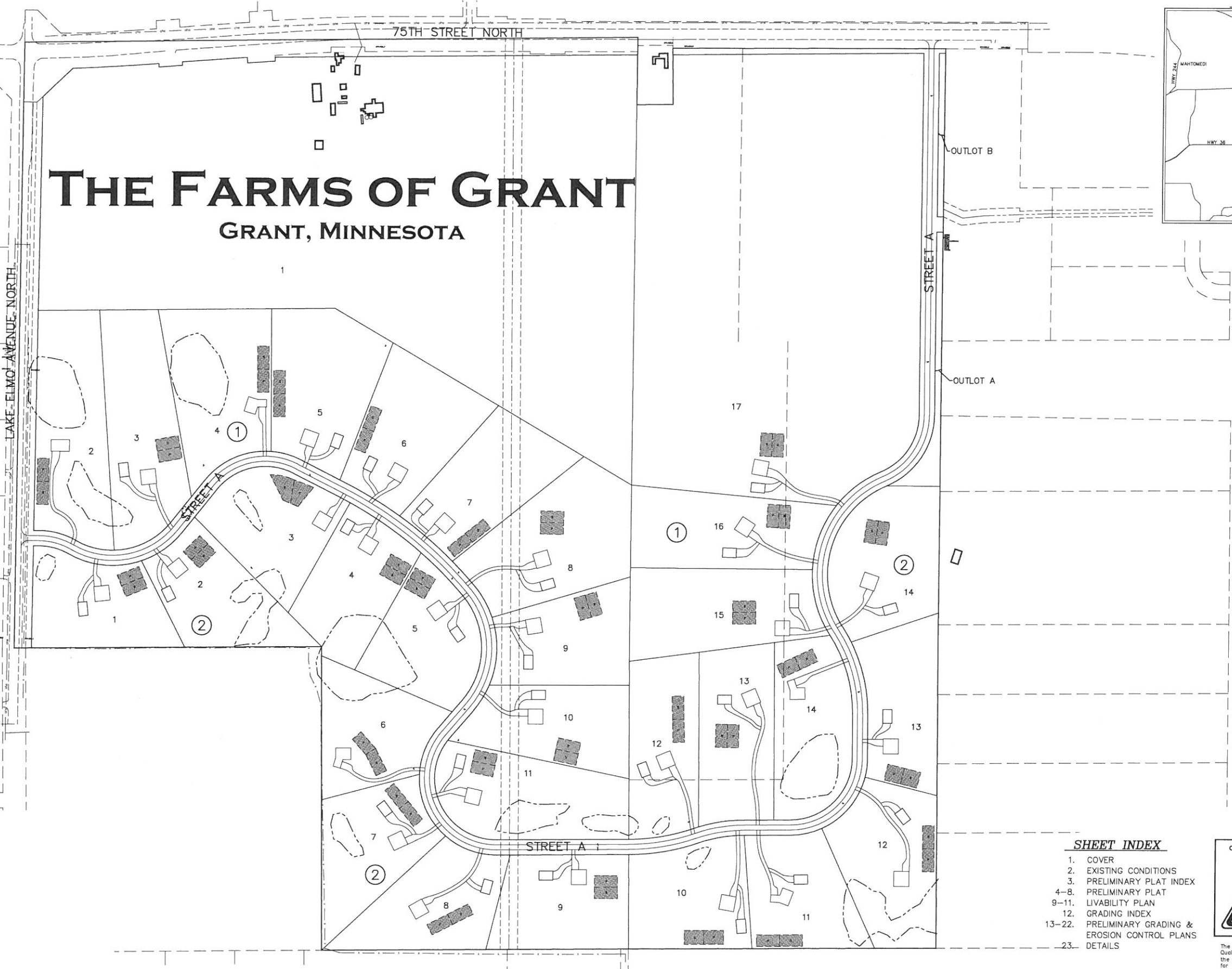
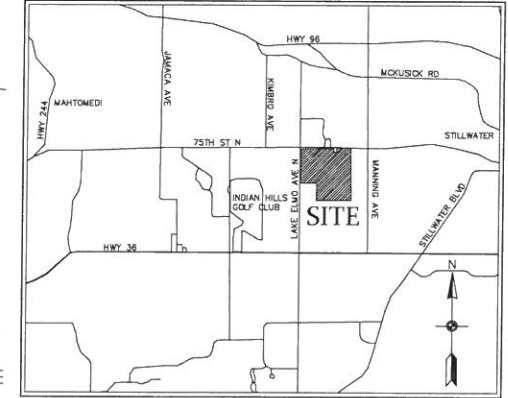


# THE FARMS OF GRANT

## GRANT, MINNESOTA

### VICINITY MAP



| BENCHMARKS |  |
|------------|--|
| 1.         | Minnesota Department of Transportation Geodetic Monument Station No. 85671, MnDot Name ALEX, ELEVATION: 944.84 (NAVD 88)         |
| 2.         | Minnesota Department of Transportation Geodetic Monument Station No. 33477, MnDot Name AAMDOT MNDT, ELEVATION: 1008.95 (NAVD 88) |

| SHEET INDEX |   |
|-------------|---|
| 1.          | COVER                                       |
| 2.          | EXISTING CONDITIONS                         |
| 3.          | PRELIMINARY PLAT INDEX                      |
| 4-8.        | PRELIMINARY PLAT                            |
| 9-11.       | LIVABILITY PLAN                             |
| 12.         | GRADING INDEX                               |
| 13-22.      | PRELIMINARY GRADING & EROSION CONTROL PLANS |
| 23.         | DETAILS                                     |

CALL BEFORE YOU DIG

Know what's below.  
Call before you dig.

The subsurface utility information shown on this plan is utility Quality Level D. This quality level was determined according to the guidelines of G/ASCE 38-02, entitled "Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data."

3890 Pheasant Ridge Drive NE,  
Suite 100  
Blaine, MN 55449  
Phone: (763) 489-7900  
Fax: (763) 489-7959  
www.carlsonmccain.com

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.

Print Name: Joseph T. Rasmussen  
Signature:   
Date: 3/20/17 License #: 45889

Drawn: JJD  
Designed: JTR  
Date: 3/20/17

Revisions:  
1. 4/10/17 City & County Comments

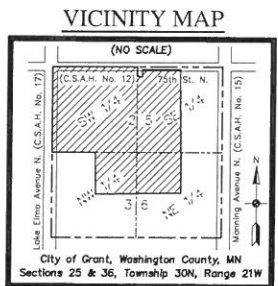
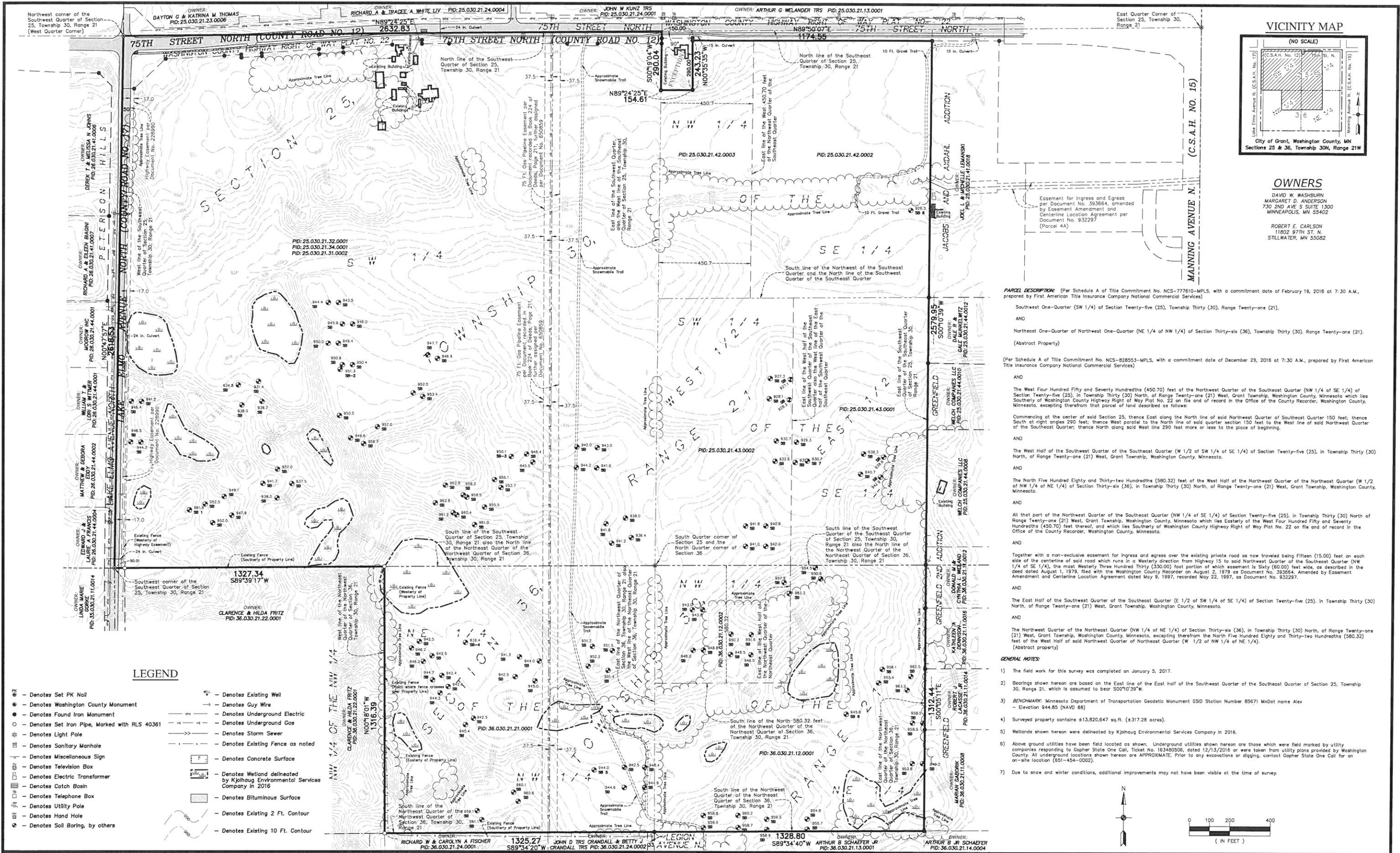
STREETCAR HOLDINGS, LLC.

4084 Oakbrooke Alcove  
Eagan, MN 55122

THE FARMS OF GRANT

City of Grant, MN

COVER SHEET



**OWNERS**  
 DAVID W. WASHBURN  
 MARGARET D. ANDERSON  
 730 2ND AVE S SUITE 1300  
 MINNEAPOLIS, MN 55402  
 ROBERT E. CARLSON  
 11802 97TH ST. N.  
 STILLWATER, MN 55082

**PARCEL DESCRIPTION:** (Per Schedule A of Title Commitment No. NCS-777610-MPLS, with a commitment date of February 19, 2016 at 7:30 A.M., prepared by First American Title Insurance Company National Commercial Services)  
 Southwest One-Quarter (SW 1/4) of Section Twenty-five (25), Township Thirty (30), Range Twenty-one (21),  
 AND  
 Northeast One-Quarter of Northwest One-Quarter (NE 1/4 of NW 1/4) of Section Thirty-six (36), Township Thirty (30), Range Twenty-one (21).  
 (Abstract Property)

(Per Schedule A of Title Commitment No. NCS-828553-MPLS, with a commitment date of December 29, 2016 at 7:30 A.M., prepared by First American Title Insurance Company National Commercial Services)  
 AND  
 The West Four Hundred Fifty and Seventy Hundredths (450.70) feet of the Northwest Quarter of the Southeast Quarter (NW 1/4 of SE 1/4) of Section Twenty-five (25), in Township Thirty (30) North, of Range Twenty-one (21) West, Grant Township, Washington County, Minnesota, which lies Southerly of Washington County Highway Right of Way Plot No. 22 on file and of record in the Office of the County Recorder, Washington County, Minnesota, excepting therefrom that parcel of land described as follows:

Commencing at the center of said Section 25, thence East along the North line of said Northwest Quarter of Southeast Quarter 150 feet; thence South at right angles 290 feet; thence West parallel to the North line of said quarter section 150 feet to the West line of said Northwest Quarter of the Southeast Quarter; thence North along said West line 290 feet more or less to the place of beginning.  
 AND  
 The West Half of the Southwest Quarter of the Southeast Quarter (W 1/2 of SW 1/4 of SE 1/4) of Section Twenty-five (25), in Township Thirty (30) North, of Range Twenty-one (21) West, Grant Township, Washington County, Minnesota.

AND  
 The North Five Hundred Eighty and Thirty-two Hundredths (580.32) feet of the West Half of the Northwest Quarter of the Northeast Quarter (W 1/2 of NW 1/4 of NE 1/4) of Section Thirty-six (36), in Township Thirty (30) North, of Range Twenty-one (21) West, Grant Township, Washington County, Minnesota, excepting therefrom the North Five Hundred Eighty and Thirty-two Hundredths (580.32) feet of the West Half of said Northwest Quarter of Northeast Quarter (W 1/2 of NW 1/4 of NE 1/4).  
 (Abstract Property)

- GENERAL NOTES:**
- The field work for this survey was completed on January 5, 2017.
  - Bearings shown hereon are based on the East line of the East half of the Southwest Quarter of the Southeast Quarter of Section 25, Township 30, Range 21, which is assumed to bear S00°10'39"W.
  - BENCHMARK: Minnesota Department of Transportation Geodetic Monument GSD Station Number 65671 MnDot name Alex - Elevation 944.85 (NAVD 88)
  - Surveyed property contains ±13,820,647 sq. ft. (±317.28 acres).
  - Wetlands shown hereon were delineated by Kjhough Environmental Services Company in 2016.
  - Above ground utilities have been field located as shown. Underground utilities shown hereon are those which were field marked by utility companies responding to Gopher State One Call, Ticket No. 163480306, dated 12/13/2016 or were taken from utility plans provided by Washington County. All underground locations shown hereon are APPROXIMATE. Prior to any excavations or digging, contact Gopher State One Call for an on-site location (851-454-0002).
  - Due to snow and winter conditions, additional improvements may not have been visible at the time of survey.

**LEGEND**

- PK - Denotes Set PK Nail
- W - Denotes Existing Well
- - Denotes Washington County Monument
- - Denotes Found Iron Monument
- - Denotes Set Iron Pipe, Marked with RLS 40361
- - Denotes Light Pole
- ⊙ - Denotes Sanitary Manhole
- ⊙ - Denotes Miscellaneous Sign
- ⊙ - Denotes Television Box
- ⊙ - Denotes Electric Transformer
- ⊙ - Denotes Catch Basin
- ⊙ - Denotes Telephone Box
- ⊙ - Denotes Utility Pole
- ⊙ - Denotes Hand Hole
- ⊙ - Denotes Soil Boring, by others
- - Denotes Existing Fence
- - Denotes Guy Wire
- - Denotes Underground Electric
- - Denotes Underground Gas
- - Denotes Storm Sewer
- - Denotes Existing Fence as noted
- - Denotes Concrete Surface
- - Denotes Wetland delineated by Kjhough Environmental Services Company in 2016
- - Denotes Bituminous Surface
- - Denotes Existing 2 Ft. Contour
- - Denotes Existing 10 Ft. Contour

**Carlson McCain**  
 environmental  
 engineering  
 surveying

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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 Land Surveyor under the laws of the State of Minnesota.  
 Signature: *Thomas R. Bull*  
 Date: 1/20/2017 License #: 40361

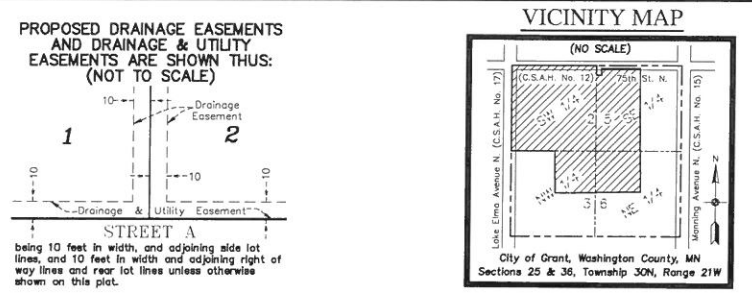
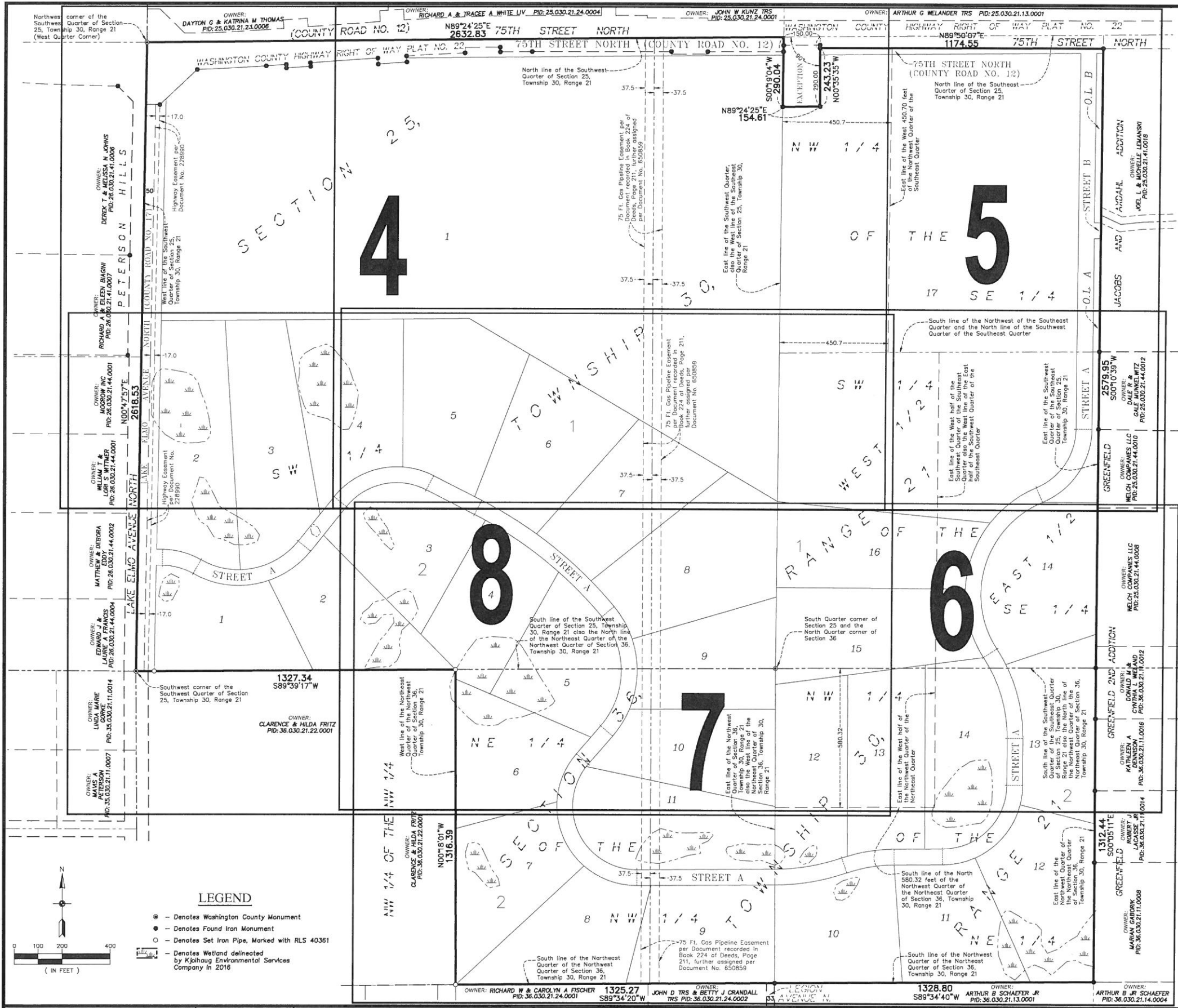
Print Name: Thomas R. Bull, D.L.S.  
 DRAWN BY: JAB  
 Revisions: 1) 4/10/17 City & County Comments  
 ISSUE DATE: 1/20/2017  
 FILE NO.: 1353

**STREETCAR HOLDINGS, LLC**  
 4084 Oakbrooke Alcove  
 Eagan, MN 55122

**THE FARMS OF GRANT**  
 City of Grant, Minnesota

**EXISTING CONDITIONS**  
 2 of 23





**PROPOSED DRAINAGE EASEMENTS AND DRAINAGE & UTILITY EASEMENTS ARE SHOWN THUS: (NOT TO SCALE)**

1 - Drainage Easement  
2 - Drainage & Utility Easement

**STREET A**  
being 10 feet in width, and adjoining side lot lines, and 10 feet in width and adjoining right of way lines and rear lot lines unless otherwise shown on this plat.

**PARCEL DESCRIPTION:** (Per Schedule A of Title Commitment No. NCS-777610-NPLS, with a commitment date of February 19, 2016 at 7:30 A.M., prepared by First American Title Insurance Company National Commercial Services)

Southwest One-Quarter (SW 1/4) of Section Twenty-five (25), Township Thirty (30), Range Twenty-one (21),

AND

Northeast One-Quarter of Northwest One-Quarter (NE 1/4 of NW 1/4) of Section Thirty-six (36), Township Thirty (30), Range Twenty-one (21). (Abstract Property)

(Per Schedule A of Title Commitment No. NCS-828553-NPLS, with a commitment date of December 29, 2016 at 7:30 A.M., prepared by First American Title Insurance Company National Commercial Services)

AND

The West Four Hundred Fifty and Seventy Hundredths (450.70) feet of the Northwest Quarter of the Southeast Quarter (NW 1/4 of SE 1/4) of Section Twenty-five (25), in Township Thirty (30) North, of Range Twenty-one (21) West, Grant Township, Washington County, Minnesota which lies South of Washington County Highway Right of Way Plat No. 22 on file and of record in the Office of the County Recorder, Washington County, Minnesota, excepting therefrom that parcel of land described as follows:

Commencing at the center of said Section 25, thence East along the North line of said Northwest Quarter of Southeast Quarter 150 feet; thence South at right angles 290 feet; thence West parallel to the North line of said quarter section 150 feet to the West line of said Northwest Quarter of the Southeast Quarter; thence North along said West line 250 feet more or less to the place of beginning.

AND

The West Half of the Southwest Quarter of the Southeast Quarter (W 1/2 of SW 1/4 of SE 1/4) of Section Twenty-five (25), in Township Thirty (30) North, of Range Twenty-one (21) West, Grant Township, Washington County, Minnesota.

AND

The North Five Hundred Eighty and Thirty-two Hundredths (580.32) feet of the West Half of the Northwest Quarter of the Northeast Quarter (W 1/2 of NW 1/4 of NE 1/4) of Section Thirty-six (36), in Township Thirty (30) North, of Range Twenty-one (21) West, Grant Township, Washington County, Minnesota.

AND

All that part of the Northwest Quarter of the Southeast Quarter (NW 1/4 of SE 1/4) of Section Twenty-five (25), in Township Thirty (30) North of Range Twenty-one (21) West, Grant Township, Washington County, Minnesota which lies Easterly of the West Four Hundred Fifty and Seventy Hundredths (450.70) feet thereof, and which lies Southerly of Washington County Highway Right of Way Plat No. 22 on file and of record in the Office of the County Recorder, Washington County, Minnesota.

AND

Together with a non-exclusive easement for ingress and egress over the existing private road as now traveled being Fifteen (15.00) feet on each side of the centerline of said road which runs in a Westerly direction from Highway 15 to said Northwest Quarter of the Southeast Quarter (NW 1/4 of SE 1/4), the most Westerly Three Hundred Thirty (330.00) foot portion of which easement is Sixty (60.00) feet wide, as described in the deed dated August 2, 1978, filed with the Washington County Recorder on August 2, 1978 as Document No. 39366A. Amended by Easement Amendment and Centerline Location Agreement dated May 5, 1997, recorded May 22, 1997, as Document No. 932297.

AND

The East Half of the Southwest Quarter of the Southeast Quarter (E 1/2 of SW 1/4 of SE 1/4) of Section Twenty-five (25), in Township Thirty (30) North, of Range Twenty-one (21) West, Grant Township, Washington County, Minnesota.

AND

The Northwest Quarter of the Northeast Quarter (NW 1/4 of NE 1/4) of Section Thirty-six (36), in Township Thirty (30) North, of Range Twenty-one (21) West, Grant Township, Washington County, Minnesota, excepting therefrom the North Five Hundred Eighty and Thirty-two Hundredths (580.32) feet of the West Half of said Northwest Quarter of Northeast Quarter (W 1/2 of NW 1/4 of NE 1/4).

(Abstract property)

- GENERAL NOTES:**
- The field work for this survey was completed on January 5, 2017.
  - Bearings shown hereon are based on the East line of the East half of the Southwest Quarter of the Southeast Quarter of Section 25, Township 30, Range 21, which is assumed to bear S00°10'35"W.
  - BENCHMARK:** Minnesota Department of Transportation Geodetic Monument GSD Station Number 85671 MnDot name Alex - Elevation 944.85 (NAVD 88)
  - Surveyed property contains ±13,820,647 sq.ft. (±317.28 acres).
  - Wetlands shown hereon were delineated by Kjolhaug Environmental Services Company in 2016.
  - Above ground utilities have been field located as shown. Underground utilities shown hereon are those which were field marked by utility companies responding to Gopher State One Call, Ticket No. 163480506, dated 12/13/2016 or were taken from utility plans provided by Washington County. All underground locations shown hereon are APPROXIMATE. Prior to any excavations or digging, contact Gopher State One Call for an on-site location (651-454-0002).
  - Due to snow and winter conditions, additional improvements may not have been visible at the time of survey.

**SITE DATA**

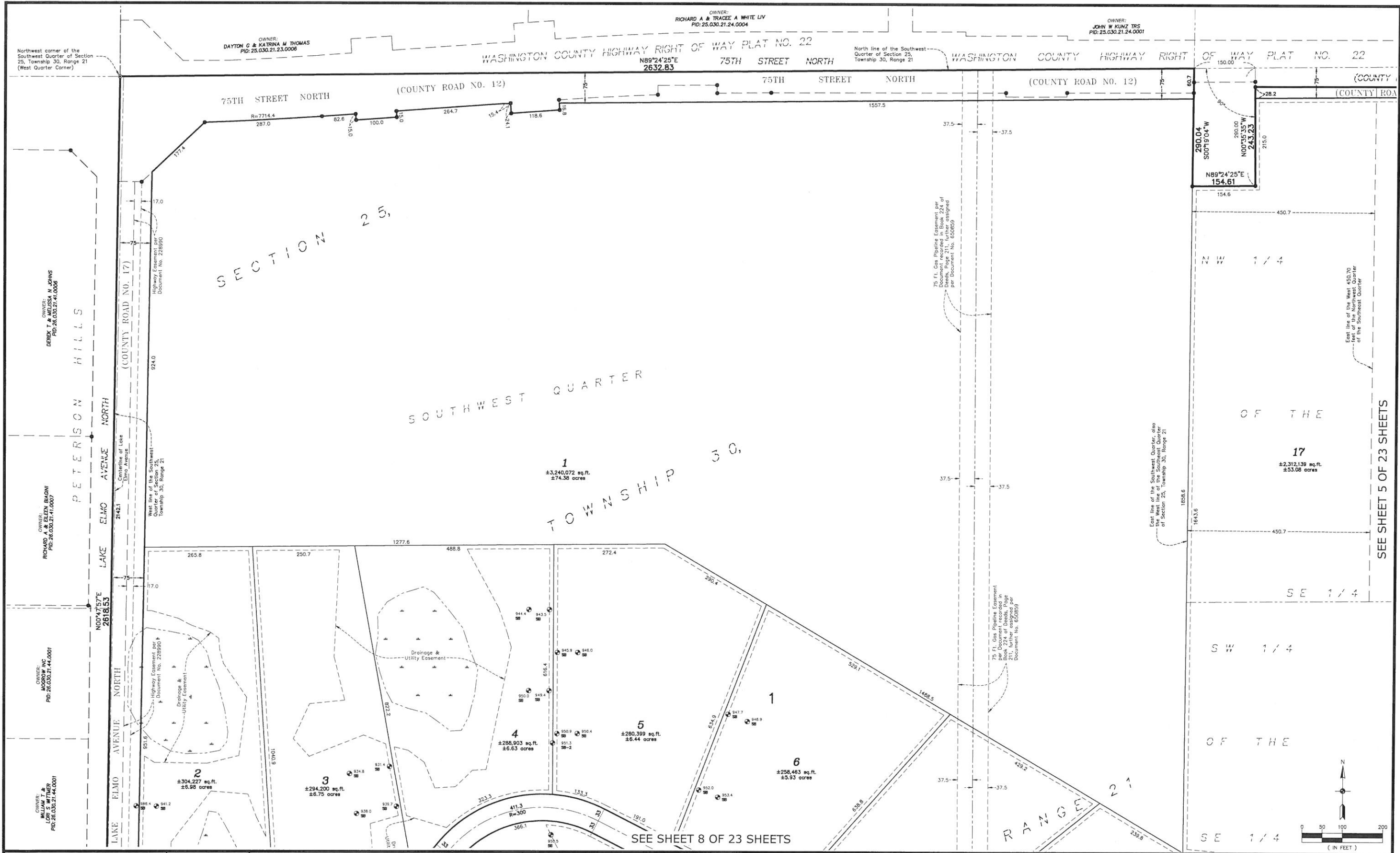
|                               |                |
|-------------------------------|----------------|
| TOTAL SITE AREA               | ±317.28 AC.    |
| TOTAL ROW AREA                | ±23.68 AC.     |
| COUNTY ROADS ROW AREA         | ±10.54 AC.     |
| CITY ROADS ROW AREA           | ±13.14 AC.     |
| TOTAL OUTLOT AREA             | ±1.51 AC.      |
| OUTLOT A                      | ±1.07 AC.      |
| OUTLOT B                      | ±0.44 AC.      |
| TOTAL LOT AREA                | ±292.08 AC.    |
| SMALLEST LOT                  | ±5.00 AC.      |
| LARGEST LOT                   | ±74.38 AC.     |
| AVERAGE LOT                   | ±9.42 AC.      |
| TOTAL NUMBER OF LOTS          | 33             |
| OUTLOTS                       | 2              |
| SINGLE FAMILY LOTS            | 31             |
| GROSS DENSITY                 | ±0.10 LOTS/AC. |
| NET DENSITY                   | ±0.11 LOTS/AC. |
| EXISTING ZONING               | A-1            |
| PROPOSED ZONING               | A-1            |
| EXISTING ABUTTING LAND ZONING | A-1            |

**MINIMUM BUILDING SETBACKS:**

|                    |        |
|--------------------|--------|
| FRONT              | 65 FT. |
| HOUSE SIDE         | 20 FT. |
| GARAGE SIDE        | 20 FT. |
| SIDE STREET CORNER | 65 FT. |
| REAR               | 55 FT. |

**CALL BEFORE YOU DIG**

**811**  
Know what's below.  
Call before you dig.



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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 Land Surveyor under the laws of the State of Minnesota.  
Date: 1/20/2017 License #: 40361

Print Name: Thomas R. B...  
Signature: [Signature]  
DRAWN BY: JAB  
ISSUE DATE: 1/20/2017  
FILE NO.: 1353

Revisions:  
1) 4/10/17 City & County Comments

**STREETCAR HOLDINGS, LLC**  
4084 Oakbrooke Alcove  
Eagan, MN 55122

**THE FARMS OF GRANT**  
City of Grant, Minnesota

**PRELIMINARY PLAT**

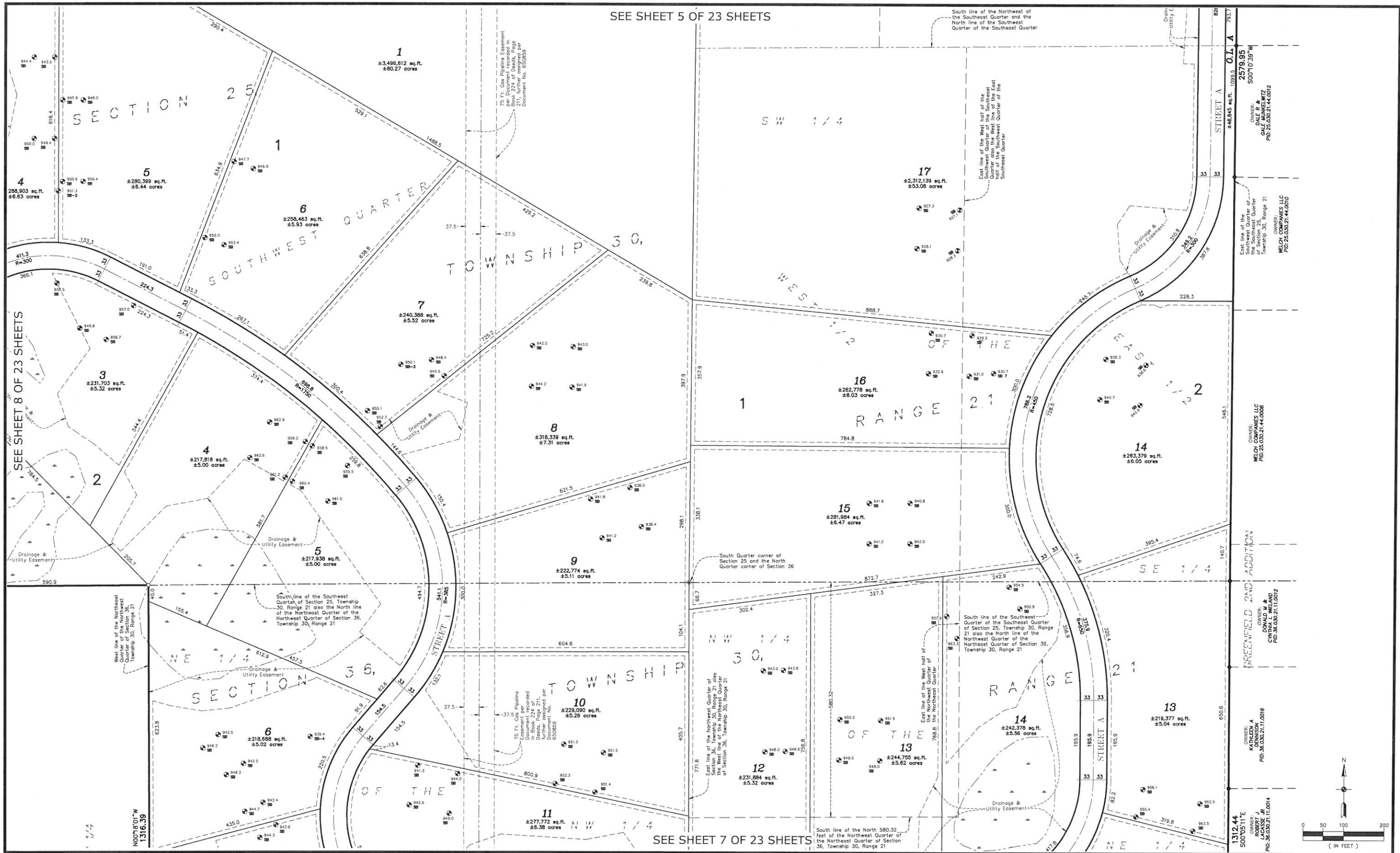
4 of 23

Users: [unreadable]





SEE SHEET 5 OF 23 SHEETS



SEE SHEET 7 OF 23 SHEETS



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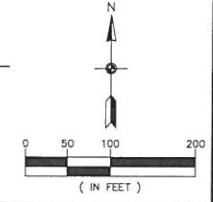
Revisions:  
1) 4/10/17 City & County Comments

**STREETCAR HOLDINGS, LLC**  
4084 Oakbrooke Alcove  
Eagan, MN 55122

**THE FARMS OF GRANT**  
City of Grant, Minnesota

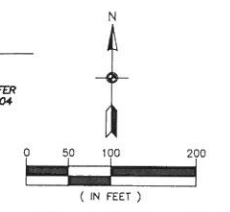
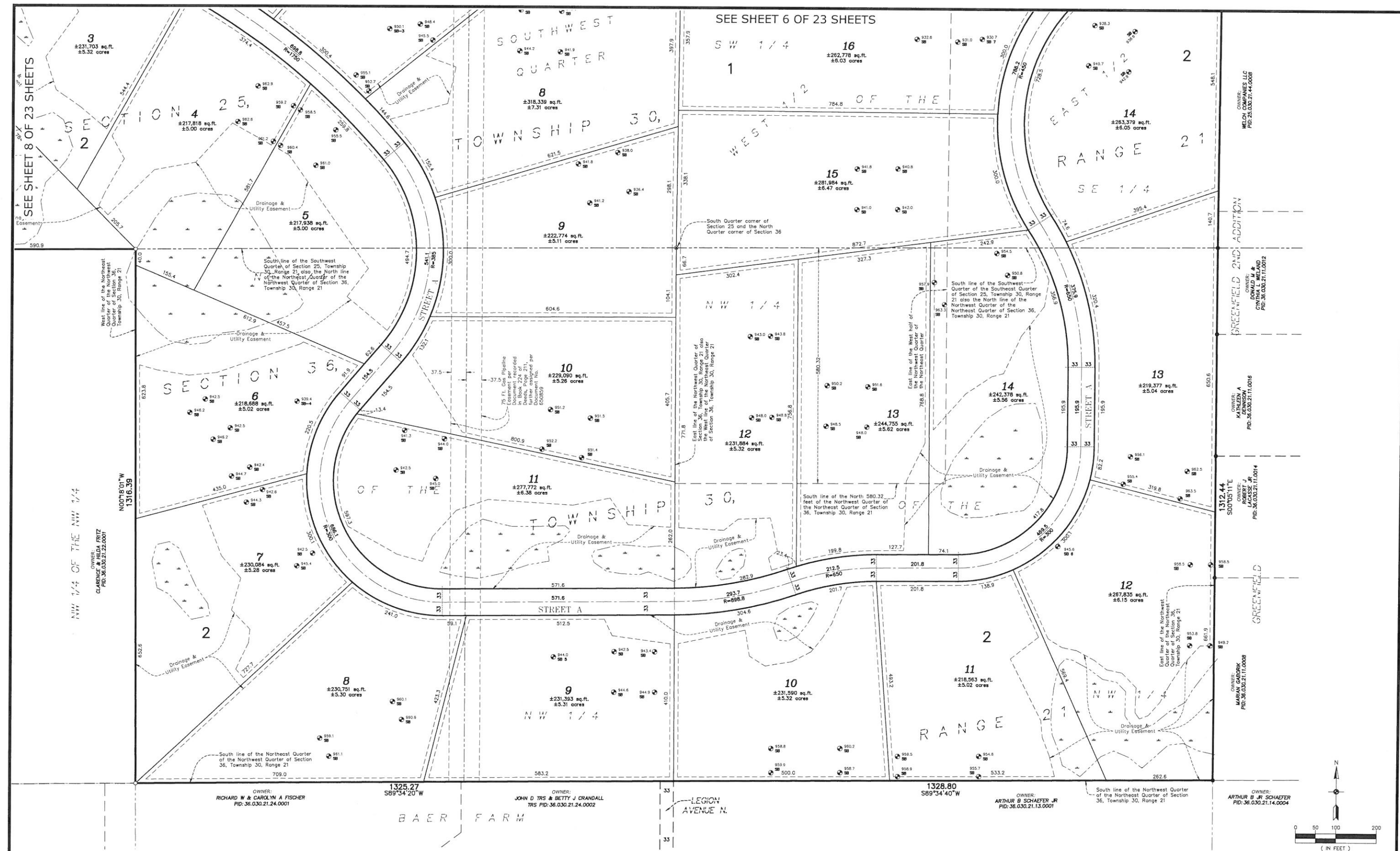
**PRELIMINARY PLAT**

6 of 23



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**Carlson McCain**  
 • environmental  
 • engineering  
 • surveying  
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 Print Name: Thomas R. Bull  
 Signature: [Signature]  
 Date: 1/20/2017 License #: 40361

DRAWN BY: JAS  
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 FILE NO: 1353

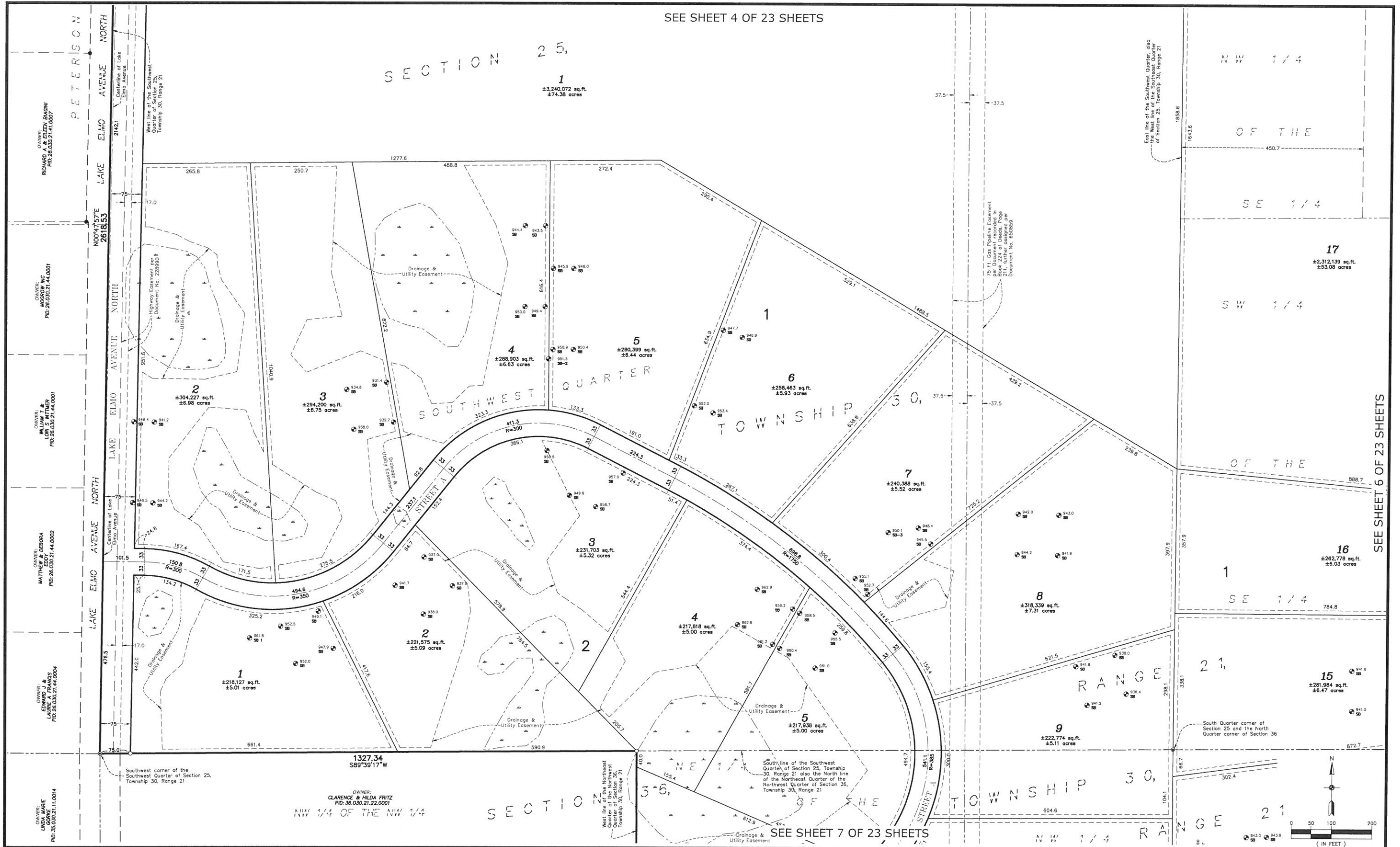
**STREETCAR HOLDINGS, LLC**  
 4084 Oakbrooke Alcove  
 Eagan, MN 55122

**THE FARMS OF GRANT**  
 City of Grant, Minnesota

**PRELIMINARY PLAT**  
 7 of 23

SEE SHEET 4 OF 23 SHEETS

SECTION 25,  
1  
±3,240,072 sq.ft.  
±74.38 acres



SEE SHEET 7 OF 23 SHEETS

SEE SHEET 6 OF 23 SHEETS



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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 Land Surveyor under the laws of the State of Minnesota

Print Name: Thomas R. Bullock  
Signature: *Thomas R. Bullock*  
Date: 1/20/2017 License #: 40361

DRAWN BY: JAB  
ISSUE DATE: 1/20/2017  
FILE NO: 1353

Revisions: 1) 4/10/17 City & County Comments

**STREETCAR HOLDINGS, LLC**  
4084 Oakbrooke Alcove  
Eagan, MN 55122

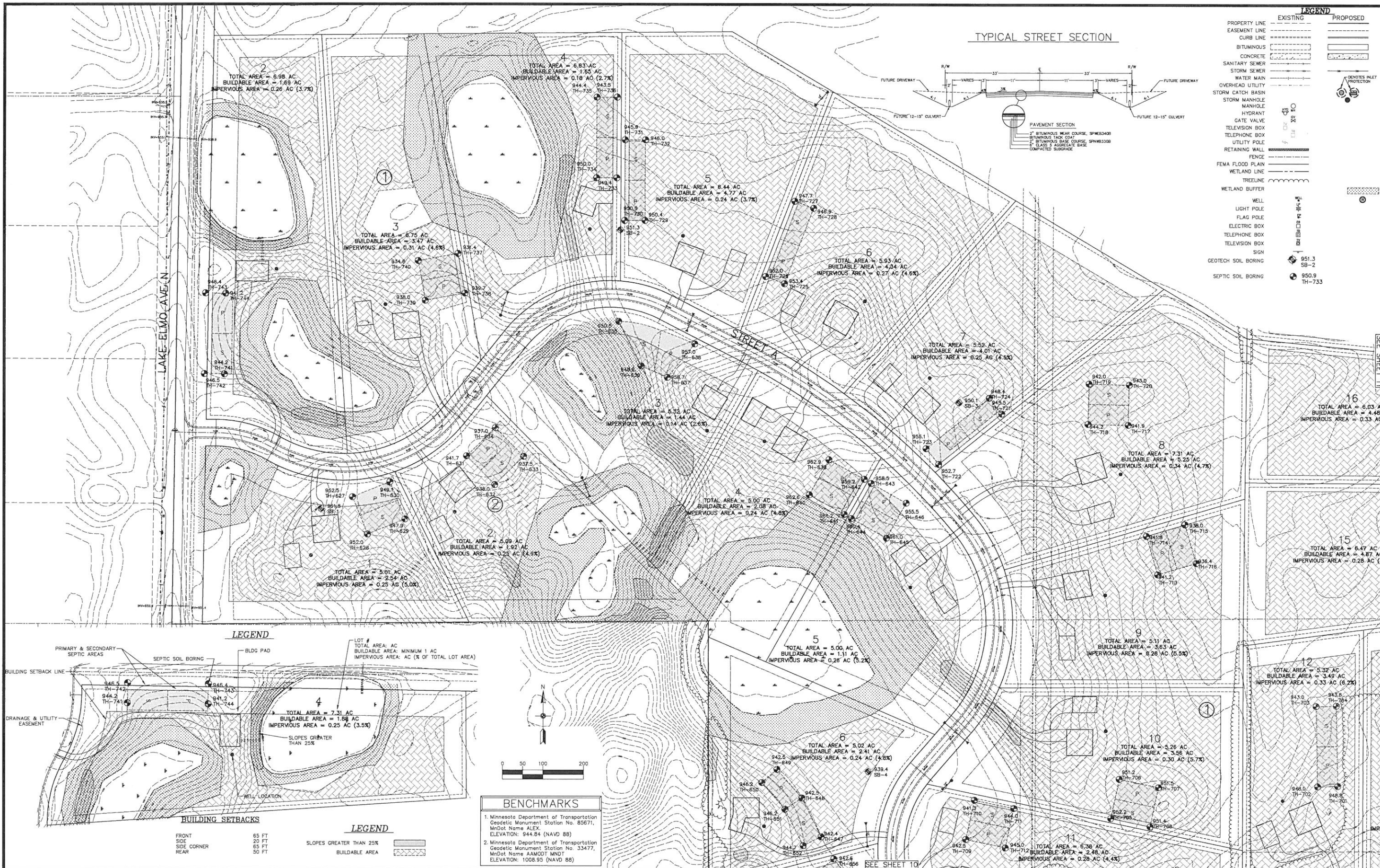
**THE FARMS OF GRANT**  
City of Grant, Minnesota

**PRELIMINARY PLAT**

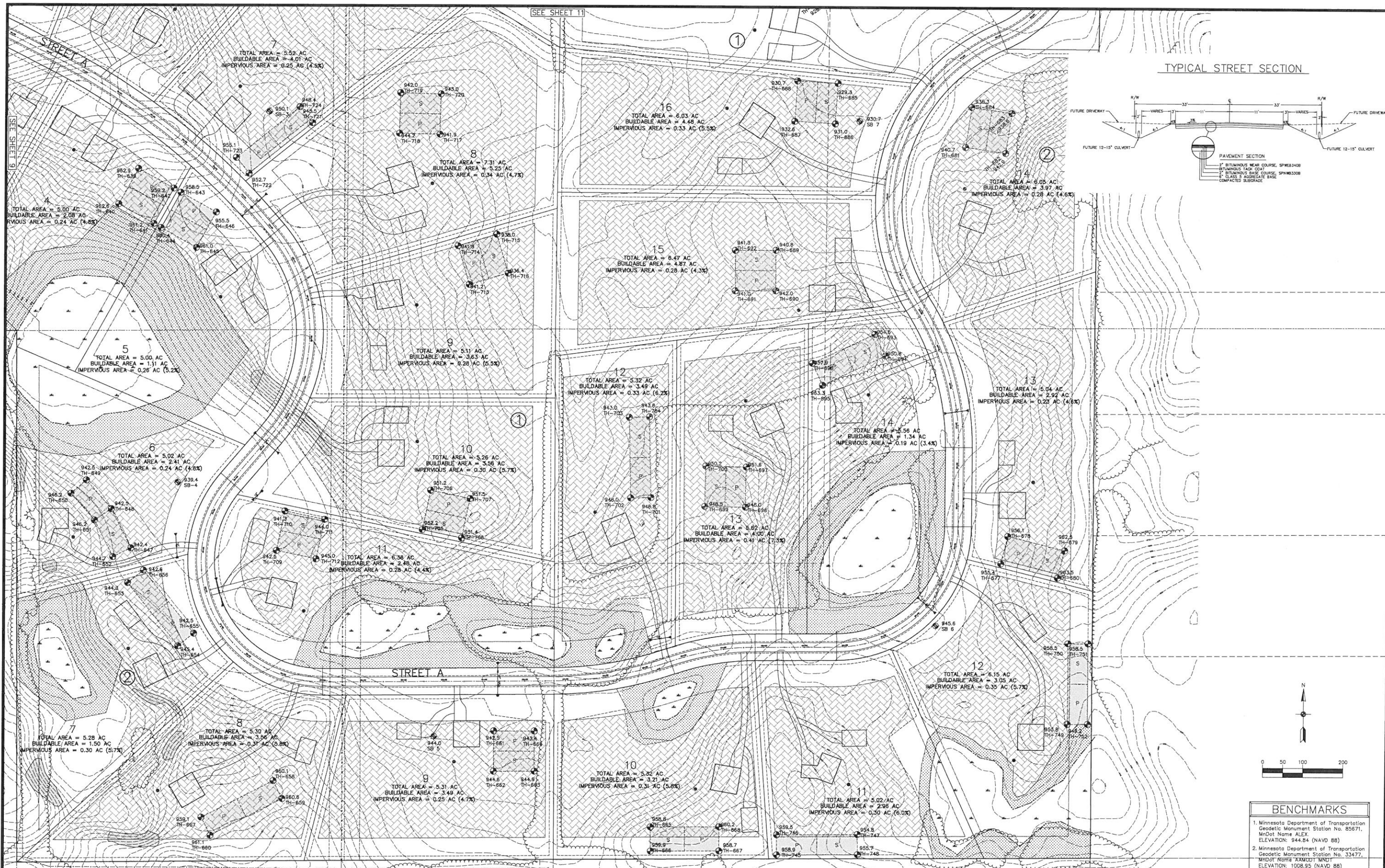
8 of 23

Blaine Date: 04/11/17 File: 65466333 - grant township property cad file: 04/11/17 65466333-pp.dwg









**Carlson McCain**

- environmental
- engineering
- surveying

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Print Name: Joseph T. Rasmussen  
 Signature: [Signature]  
 License #: 45889  
 Date: 1/20/17

Drawn: JJO  
 Designed: JTR  
 Date: 1/20/17

Revisions: 1. 4/10/17 City & County Comments

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**THE FARMS OF GRANT**  
 City of Grant, MN

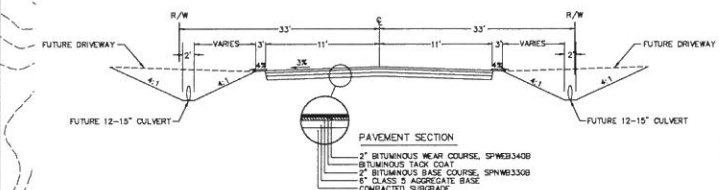
**LIVABILITY PLAN**

10 of 23

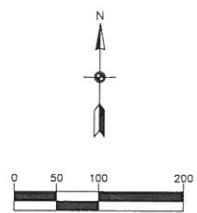


75TH STREET N

TYPICAL STREET SECTION



PAVEMENT SECTION  
 2" BITUMINOUS WEAR COURSE, SPW63340B  
 BITUMINOUS TACK COAT  
 2" BITUMINOUS BASE COURSE, SPW6330B  
 4" CLASS 2 AGGREGATE BASE  
 COMPACTED SUBGRADE



- BENCHMARKS**
1. Minnesota Department of Transportation  
Geodetic Monument Station No. 85671,  
MnDot Name ALEX,  
ELEVATION: 944.84 (NAVD 88)
  2. Minnesota Department of Transportation  
Geodetic Monument Station No. 33477,  
MnDot Name AAMDOT MNDT  
ELEVATION: 1008.95 (NAVD 88)

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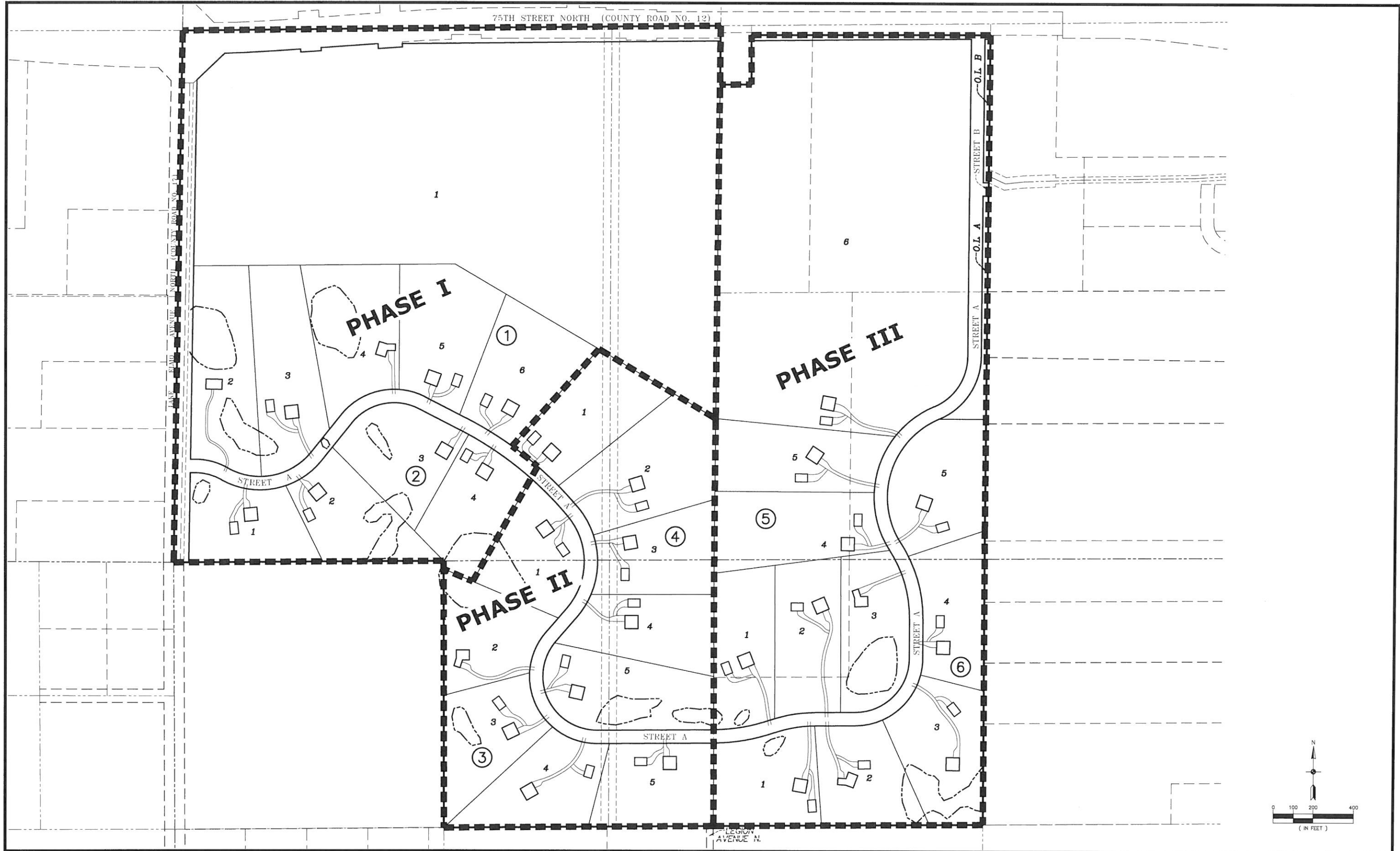
Revisions:  
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Drawn: JJO  
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**THE FARMS OF GRANT**  
 City of Grant, MN

**LIVABILITY PLAN**



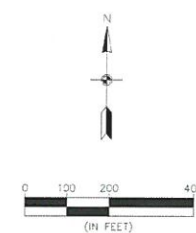
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West Intersection  
Screening Location

East Property  
Screening Location



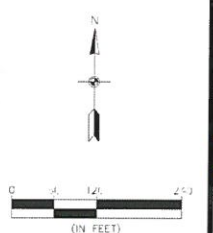




WEST INTERSECTION ADDITIONAL SCREENING

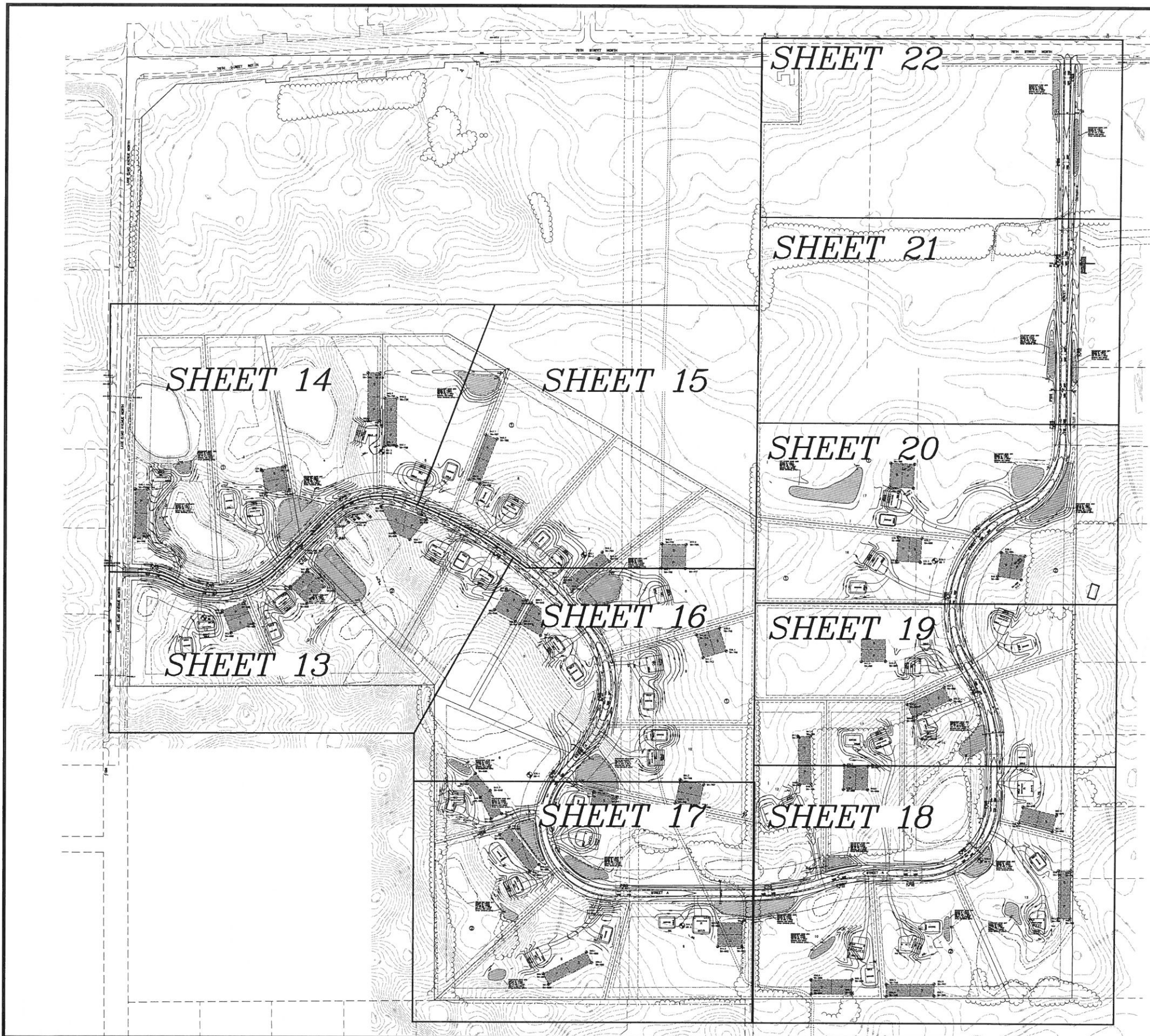


EAST PROPERTY ADDITIONAL SCREENING



Save Date: 04/06/17 1:10pm:5511 - 63405533 - grant townshp property of c33engineering\9333\_insp\_screening.dwg

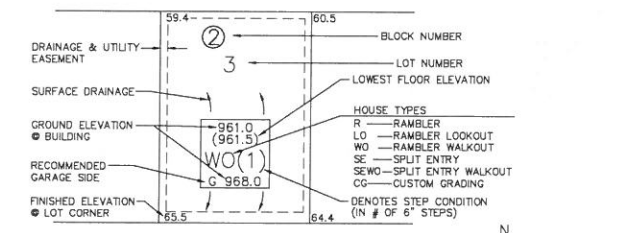




**LEGEND**

|                          | EXISTING | PROPOSED |
|--------------------------|----------|----------|
| PROPERTY LINE            | ---      | ---      |
| EASEMENT LINE            | ---      | ---      |
| CURB LINE                | ---      | ---      |
| BITUMINOUS               | ---      | ---      |
| CONCRETE                 | ---      | ---      |
| SANITARY SEWER           | ---      | ---      |
| STORM SEWER              | ---      | ---      |
| WATER MAIN               | ---      | ---      |
| OVERHEAD UTILITY         | ---      | ---      |
| STORM CATCH BASIN        | ---      | ---      |
| STORM MANHOLE            | ---      | ---      |
| OUTLET CONTROL STRUCTURE | ---      | ---      |
| MANHOLE                  | ---      | ---      |
| HYDRANT                  | ---      | ---      |
| GATE VALVE               | ---      | ---      |
| TELEVISION BOX           | ---      | ---      |
| TELEPHONE BOX            | ---      | ---      |
| UTILITY POLE             | ---      | ---      |
| RETAINING WALL           | ---      | ---      |
| FENCE                    | ---      | ---      |
| 10' CONTOUR              | ---      | ---      |
| 2' CONTOUR               | ---      | ---      |
| FEMA FLOOD PLAIN         | ---      | ---      |
| WETLAND LINE             | ---      | ---      |
| SPOT ELEVATION           | ---      | ---      |
| EMERGENCY OVERFLOW       | ---      | ---      |
| SILT FENCE               | ---      | ---      |
| TREE FENCE               | ---      | ---      |
| GRADING LIMITS           | ---      | ---      |
| TREELINE                 | ---      | ---      |
| INFILTRATION AREA        | ---      | ---      |
| WELL                     | ---      | ---      |
| LIGHT POLE               | ---      | ---      |
| FLAG POLE                | ---      | ---      |
| ELECTRIC BOX             | ---      | ---      |
| TELEPHONE BOX            | ---      | ---      |
| TELEVISION BOX           | ---      | ---      |
| SIGN                     | ---      | ---      |
| GEOTECH SOIL BORING      | ---      | ---      |
| SEPTIC SOIL BORING       | ---      | ---      |

**GRADING PLAN LOT KEY**



**BENCHMARKS**

- Minnesota Department of Transportation Geodetic Monument Station No. 85671, MnDot Name ALEX, ELEVATION: 944.84 (NAVD 88)
- Minnesota Department of Transportation Geodetic Monument Station No. 33477, MnDot Name AAMODT MNDT, ELEVATION: 1008.95 (NAVD 88)

**WETLAND FILL SUMMARY**

|   | AREA         |
|---|--------------|
| WETLAND FILL:   | 1,355 S.F.   |
| TOTAL WETLAND IMPACT:   | 1,355 S.F.   |
| NOTE: WETLAND REPLACEMENT CREDITS TO BE PURCHASED IN LIEU OF ON-SITE REPLACEMENT. |              |
| WETLAND BUFFER:   | 860,251 S.F. |
| WETLAND BUFFER REQUIRED:  | 679,645 S.F. |

**CALL BEFORE YOU DIG**

Know what's below. Call before you dig.

The subsurface utility information shown on this plan is utility Quality Level D. This quality level was determined according to the guidelines of G/ASCE 36-02, entitled "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data."

**Carlson McCain**

- environmental
- engineering
- surveying

3890 Pheasant Ridge Drive NE, Suite 100  
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Fax: (763) 489-7959  
www.carlsonmccain.com

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

Print Name: Joseph T. Radach, P.E.  
Signature: [Signature]  
Date: 1/20/17 License #: 45889

Drawn: JJO  
Designed: JTR  
Date: 1/20/17

Revisions:  
1.

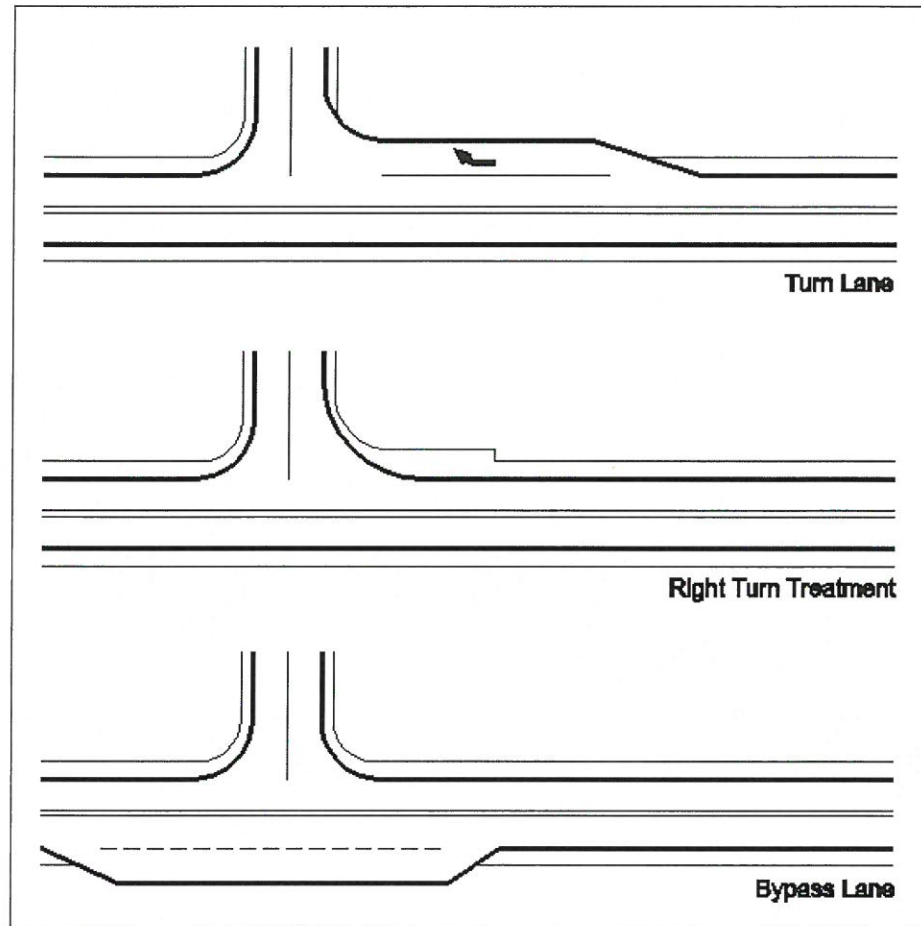
**STREETCAR HOLDINGS, LLC.**  
4084 Oakbrooke Alcove  
Eagan, MN 55122

**THE FARMS OF GRANT**  
City of Grant, MN



**Mn/DOT Access Management Manual**

Figure 3.39: Right-turn Treatments & Bypass Lanes



Turn-Lane Warrants for Undivided Highways

The Turn-Lane Warrants for Undivided Highways are shown below. These warrants apply to both left-turn lanes and right-turn lanes.

- Warrant 1: Passing Lane/Climbing Lane – At high-volume driveways (> 100 trips per day) and all public street connections located on highway segments where passing lanes or climbing lanes are present in the approach direction.
- Warrant 2: Limited Sight Distance/Terrain – At all driveways and public street connections with inadequate stopping sight distance or located on short vertical curves or steep grades. Designers may consider alternative options, such as access relocation, vegetation removal, and spot grading as alternatives to building turn lanes.
- Warrant 3: Railroad Crossings – At high-volume driveways (> 100 trips per day) and all public street connections where a railroad is parallel to the highway and where the potential exists for vehicles delayed by a train to back up into the through-lanes of the highway, creating both safety and operational problems. At these locations, the queuing of traffic caused by train movements should be considered. If the cross street between the railroad and the highway does not provide adequate storage, then a turn lane or turn-lane treatment should be considered on the highway to provide the additional storage needed.

## Appendix B: MnDOT Access Management Manual

### *Mn/DOT Access Management Manual*

- Warrant 4: Signalized Intersections – At all signalized public street connections and driveways.
- Warrant 5: Heavy-Vehicle Traffic – At all driveways and public street connections on high-speed highways (posted speed  $\geq 45$  mph) where the heavy-vehicle turning volume is 15 or more vehicles per hour for at least eight hours a day for four months or more per year. Examples of this include gravel operations, large grain elevators, or large distribution centers.
- Warrant 6: School Entrances – At public and private school driveways on high-speed highways (posted speed  $\geq 45$  mph) used by school traffic.
- Warrant 7: Crash History – At high-volume driveways (>100 trips per day) and all public street connections that demonstrate a history of crashes of the type suitable to correction by a turn lane or turn-lane treatment (typically three or more correctable crashes in one year), or where adequate trial of other remedies has failed to reduce the crash frequency.
- Warrant 8: Corridor Crash Experience – On highway corridors that demonstrate a history of similar crash types suitable to correction by providing corridor-wide consistency in turn-lane use.
- Warrant 9: Vehicular Volume Warrant – At high-volume driveways (>100 trips per day) and all public street connections on high-speed highways (posted speed  $\geq 45$  mph) that satisfy the criteria in Figures 3.40 and 3.41 below.

**Figure 3.40: Warrant 9 for Left-Turn Lanes**

| 2-Lane Highway AADT | 4-Lane Highway AADT | Cross Street or Driveway ADT | Turn Lane Requirement                                     |
|---------------------|---------------------|------------------------------|---|
| 1500 to 2999        | 3000 to 5999        | > 1500                       | Left-turn lane warranted                                  |
| 3000 to 3999        | 6000 to 7999        | > 1200                       | Left-turn lane warranted                                  |
| 4000 to 4999        | 8000 to 9999        | > 1000                       | Left-turn lane warranted                                  |
| 5000 to 6499        | 10,000 to 12,999    | > 800                        | Left-turn lane warranted                                  |
| $\geq 6500$ AADT    | $\geq 13,000$ AADT  | 101 to 400<br>> 400          | Left-turn lane or bypass lane<br>Left-turn lane warranted |

*Highway AADT one year after opening  
Posted speed 45 mph or greater*

**Figure 3.41: Warrant 9 for Right-Turn Lanes**

| 2-Lane Highway AADT | 4-Lane Highway AADT | Cross Street or Driveway ADT | Turn Lane Requirement     |
|---------------------|---------------------|------------------------------|---------------------------|
| $\geq 1500$ AADT    | $\geq 3000$ AADT    | > 100                        | Right-turn lane warranted |

*Highway AADT one year after opening  
Posted speed 45 mph or greater*



## Appendix C: Sight Distance Measurements

| <b>(75th Street) Provided Sight Distance for 2 Lane Road (seconds)</b> |              |                   |              |
|--|--------------|-------------------|--------------|
| <b>Left Turn</b>   |              | <b>Right Turn</b> |              |
| <b>Count</b>   | <b>Time</b>  | <b>Count</b>      | <b>Time</b>  |
| 1  | 12           | 1                 | 14           |
| 2  | 11           | 2                 | 11           |
| 3  | 13           | 3                 | 10           |
| 4  | 13           | 4                 | 10           |
| 5  | 14           | 5                 | 15           |
| 6  | 16           | 6                 | 16           |
| 7  | 11           | 7                 | 13           |
| 8  | 10           | 8                 | 14           |
| 9  | 13           | 9                 | 17           |
| 10   | 15           | 10                | 15           |
| <b>Average</b>   | <b>12.80</b> |                   | <b>13.50</b> |

| <b>(Lake Elmo Avenue) Provided Sight Distance for 2 Lane Road (seconds)</b> |              |                   |              |
|---|--------------|-------------------|--------------|
| <b>Left Turn</b>  |              | <b>Right Turn</b> |              |
| <b>Count</b>  | <b>Time</b>  | <b>Count</b>      | <b>Time</b>  |
| 1   | 18           | 1                 | 16           |
| 2   | 15           | 2                 | 15           |
| 3   | 18           | 3                 | 15           |
| 4   | 15           | 4                 | 13           |
| 5   | 14           | 5                 | 14           |
| 6   | 19           | 6                 | 12           |
| 7   | 20           | 7                 | 8            |
| 8   | 19           | 8                 | 12           |
| 9   | 20           | 9                 | 11           |
| 10  | 14           | 10                | 9            |
| <b>Average</b>  | <b>17.20</b> |                   | <b>12.50</b> |

| <b>Required Sight Distance Turns onto 75th Street (seconds)</b> |                   |                  |
|---|-------------------|------------------|
| <b>Design Vehicle</b>   | <b>Right Turn</b> | <b>Left Turn</b> |
| Passenger Car   | 6.5               | 7.5              |
| Single Unit Truck   | 8.5               | 9.5              |
| Combination Truck   | 10.5              | 11.5             |
| <b>Supplied Sight Distance</b>                                  | <b>13.50</b>      | <b>12.80</b>     |

| <b>Required Sight Distance Turns onto Lake Elmo Avenue (seconds)</b> |                   |                  |
|--|-------------------|------------------|
| <b>Design Vehicle</b>  | <b>Right Turn</b> | <b>Left Turn</b> |
| Passenger Car  | 6.5               | 7.5              |
| Single Unit Truck  | 8.5               | 9.5              |
| Combination Truck  | 10.5              | 11.5             |
| <b>Supplied Sight</b>  | <b>12.50</b>      | <b>17.20</b>     |