

## PLAN SYMBOLS

|  |                            |
|--|----------------------------|
|  | EXISTING CENTERLINE        |
|  | PROPOSED CENTERLINE        |
|  | EXISTING RIGHT-OF-WAY LINE |
|  | PROPOSED RIGHT-OF-WAY LINE |
|  | EASEMENT LINE              |
|  | PROPERTY LINE              |
|  | LOT SECTION                |
|  | CONSTRUCTION LIMITS        |
|  | CLEAR ZONE                 |
|  | INTERMEDIATE INDEX         |
|  | GRADE BREAK                |
|  | EXISTING CONTOURS          |
|  | PROPOSED CONTOURS          |
|  | DITCH LINE                 |
|  | EXISTING COUNTY            |
|  | FENCE LINE - ANY TYPE      |
|  | BIOLOG                     |
|  | SILT FENCE                 |
|  | WETLAND BOUNDARY           |
|  | TREE LINE                  |
|  | TREE SYMBOLS               |
|  | BENCH MARK / IRON MONUMENT |
|  | LIGHT POLE / BOLLARD       |
|  | SOIL BORING                |
|  | BUILDING                   |
|  | RIPRAP                     |
|  | MAILBOX                    |
|  | EXISTING SIGN              |
|  | PROPOSED SIGN              |

## UTILITY SYMBOLS

|  |                              |
|--|------------------------------|
|  | GAS LINE                     |
|  | PETROLEUM LINE               |
|  | ELECTRIC                     |
|  | UNDERGROUND TELEPHONE LINE   |
|  | UNDERGROUND CABLE TV LINE    |
|  | UNDERGROUND FIBER OPTIC LINE |
|  | TELEPHONE STRUCTURES         |
|  | ELECTRIC JUNC. BOX           |
|  | CABLE TV JUNC. BOX           |
|  | FIBER OPTIC STRUCTURES       |
|  | POWER POLE AND GUY WIRE      |
|  | STORM DRAIN LINE             |
|  | FLARED END SECTION           |
|  | CATCH BASIN                  |
|  | MANHOLE                      |
|  | WELL                         |

## HATCH LEGEND

|  |                         |
|--|-------------------------|
|  | BITUMINOUS              |
|  | CONCRETE                |
|  | EROSION CONTROL BLANKET |
|  | GRAVEL                  |
|  | HYDROMULCH              |
|  | REMOVALS                |
|  | GRAVEL                  |
|  | CONCRETE                |
|  | BITUMINOUS              |

# MINNESOTA DEPARTMENT OF TRANSPORTATION

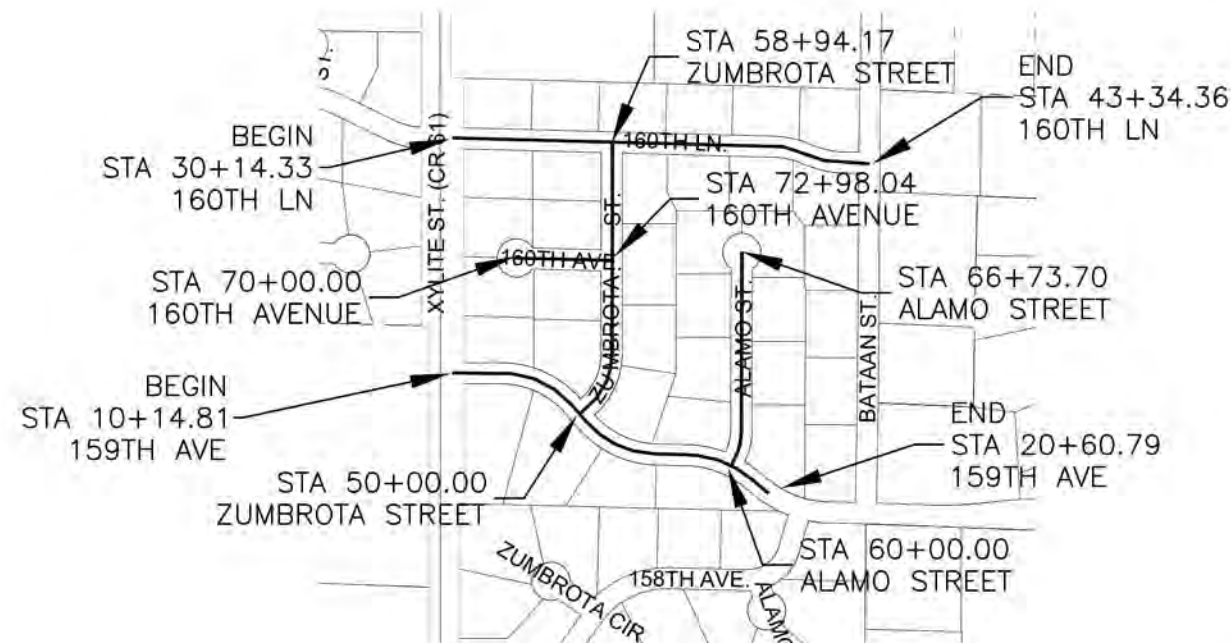
## City of Ham Lake, Minnesota

### CONSTRUCTION PLAN FOR GRADING, AGGREGATE BASE, PLANT MIXED BITUMINOUS SURFACE, STORM DRAINS, AND CONCRETE CURB

LOCATED ON 159TH AVENUE FROM XYLITE STREET TO BATAAN STREET, ZUMBROTA STREET FROM 159TH AVENUE TO 160TH LANE, 160TH AVENUE FROM ZUMBROTA STREET TO CDS, ALAMO STREET FROM 159TH AVENUE TO CDS, AND 160TH LANE FROM XYLITE STREET TO BATAAN STREET.

HAM LAKE PROJECT NO. 1907

|                   |               |            |
|-------------------|---------------|------------|
| GROSS LENGTH      | 4,231.92 FEET | 0.80 MILES |
| BRIDGES LENGTH    | 0 FEET        | 0 MILES    |
| EXCEPTIONS LENGTH | 0 FEET        | 0 MILES    |
| NET LENGTH        | 4,231.92 FEET | 0.80 MILES |



ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO THE MN MUTCD, INCLUDING FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THIS COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA"

THE UTILITIES SHOWN ARE BASED UPON THE BEST INFORMATION AVAILABLE AND MAY NOT REFLECT THE ACTUAL EFFECTS ON THE UTILITIES BY CONSTRUCTION. ACTUAL DETERMINATIONS WILL BE MADE IN THE FIELD DURING CONSTRUCTION.



PROJECT LOCATION

ANOKA COUNTY METRO DISTRICT

| PLAN REVISIONS |           |             |
|----------------|-----------|-------------|
| DATE           | SHEET NO. | APPROVED BY |
|                |           |             |
|                |           |             |
|                |           |             |

## GOVERNING SPECIFICATIONS

THE 2018 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

## INDEX

| SHEET NO. | DESCRIPTION                       |
|-----------|-----------------------------------|
| 1         | TITLE SHEET                       |
| 2         | STATEMENT OF ESTIMATED QUANTITIES |
| 3 - 4     | EARTHWORK SUMMARY AND TABULATIONS |
| 5 - 7     | DETAILS                           |
| 8 - 13    | TEMPORARY SEDIMENT CONTROL        |
| 14 - 15   | INTERSECTION DETAILS              |
| 16 - 17   | REMOVALS                          |
| 18 - 22   | PLAN AND PROFILE                  |
| 23 - 25   | STORM DRAIN PROFILES              |
| 26 - 28   | SWPPP                             |
| 29 - 30   | SIGNS                             |
| 31 - 44   | CROSS SECTIONS                    |

ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND ORDINANCES WILL BE COMPLIED WITH IN THE CONSTRUCTION OF THIS PROJECT.

THIS PLAN CONTAINS 44 SHEETS

I HEREBY CERTIFY THAT THIS PLAN 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.

SIGNED *David A. Krugler*  
David A. Krugler

DATE: 5/10/2021 REG. NO. 48768

APPROVED *Thomas P. Collins*  
CITY ENGINEER - HAM LAKE DATE: 5/10/2021

I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, OF THIS PLAN WERE MADE BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNED \_\_\_\_\_  
DATE: \_\_\_\_\_ REG. NO. \_\_\_\_\_

## RFC ENGINEERING, INC. Consulting Engineers

13635 Johnson Street NE Telephone 763-862-8000  
Ham Lake, MN 55304 Fax 763-862-8042

JOB NO. 1907 SHEET NO. 1 OF 44 SHEETS  
FILE: 35-1-130

| STATEMENT OF ESTIMATED QUANTITIES |       |       |          |                                                                 |          |                                           |
|-----------------------------------|-------|-------|----------|-----------------------------------------------------------------|----------|-------------------------------------------|
| TAB                               | SHEET | NOTES | ITEM NO. | ITEM                                                            | UNIT     | ENTIRE PROJECT<br>ESTIMATED<br>QUANTITIES |
|                                   |       |       | 2021.501 | MOBILIZATION                                                    | LUMP SUM | 1                                         |
| AI                                | 3     |       | 2104.502 | REMOVE BITUMINOUS FLUME                                         | EACH     | 4                                         |
| AA                                | 3     | 6     | 2104.502 | REMOVE SIGN                                                     | EACH     | 12                                        |
| BA                                | 4     |       | 2104.503 | SAWING CONCRETE PAVEMENT (FULL DEPTH) - DRIVEWAYS               | LIN FT   | 145                                       |
| AE                                | 3     |       | 2104.503 | SAWING BITUMINOUS PAVEMENT (FULL DEPTH) - ROADWAYS              | LIN FT   | 231                                       |
| BA                                | 4     |       | 2104.503 | SAWING BITUMINOUS PAVEMENT (FULL DEPTH) - DRIVEWAYS             | LIN FT   | 405                                       |
| AB                                | 3     |       | 2104.503 | REMOVE METAL CULVERT                                            | LIN FT   | 177                                       |
| AH                                | 3     |       | 2104.503 | REMOVE CHAIN LINK FENCE                                         | LIN FT   | 132                                       |
| BA                                | 4     |       | 2104.504 | REMOVE CONCRETE DRIVEWAY PAVEMENT                               | SQ YD    | 411                                       |
| BA                                | 4     |       | 2104.504 | REMOVE BITUMINOUS DRIVEWAY PAVEMENT                             | SQ YD    | 733                                       |
| AC                                | 3     | 11    | 2104.504 | REMOVE BITUMINOUS PAVEMENT                                      | SQ YD    | 11896                                     |
| AF, AG                            | 3     |       | 2104.618 | SALVAGE BRICK PAVERS                                            | SQ FT    | 388                                       |
| AJ                                | 3     | 4     | 2105.501 | COMMON EXCAVATION                                               | CU YD    | 4470                                      |
| AJ                                | 3     |       | 2105.521 | GRANULAR BORROW (CV)                                            | CU YD    | 750                                       |
| BB                                | 4     |       | 2211.501 | AGGREGATE BASE, CLASS 5 AND/OR 7                                | TON      | 2850                                      |
| BA                                | 4     |       | 2211.604 | AGGREGATE BASE (CV) CLASS 5 4.0" THICK - BIT DRIVEWAY           | SQ YD    | 783                                       |
| BA                                | 4     | 8     | 2360.503 | TYPE SP 9.5 WEARING COURSE MIXTURE (2:C) 2.0" THICK - DRIVEWAYS | SQ YD    | 783                                       |
| BC                                | 4     | 9     | 2360.509 | TYPE SP 9.5 WEARING COURSE MIXTURE (2:C)                        | TON      | 747                                       |
| BD                                | 4     |       | 2360.509 | TYPE SP 12.5 WEARING COURSE MIXTURE (2:C)                       | TON      | 1493                                      |
|                                   | 23-25 |       | 2501.502 | 12" GS PIPE APRON                                               | EACH     | 1                                         |
|                                   | 23-25 |       | 2501.502 | 24" GS PIPE APRON                                               | EACH     | 1                                         |
|                                   | 23-25 |       | 2501.502 | 36" GS PIPE APRON                                               | EACH     | 1                                         |
|                                   | 23-25 |       | 2501.502 | 15" RC PIPE APRON                                               | EACH     | 5                                         |
|                                   | 23-25 |       | 2501.602 | TRASH GUARD FOR 12" PIPE APRON                                  | EACH     | 1                                         |
|                                   | 23-25 |       | 2501.602 | TRASH GUARD FOR 15" PIPE APRON                                  | EACH     | 2                                         |
|                                   | 23-25 |       | 2501.602 | TRASH GUARD FOR 36" PIPE APRON                                  | EACH     | 1                                         |
|                                   | 23-25 | 1     | 2503.511 | 12" CP PIPE SEWER (SMOOTH)                                      | LIN FT   | 26                                        |
|                                   | 23-25 | 1     | 2503.511 | 15" CP PIPE SEWER (SMOOTH)                                      | LIN FT   | 27                                        |
|                                   | 23-25 | 1     | 2503.511 | 24" CP PIPE SEWER (SMOOTH)                                      | LIN FT   | 28                                        |
|                                   | 23-25 | 1     | 2503.511 | 36" CP PIPE SEWER (SMOOTH)                                      | LIN FT   | 38                                        |
|                                   | 23-25 | 1     | 2503.541 | 12" RC PIPE SEWER DESIGN 3006 CLASS IV                          | LIN FT   | 77                                        |
|                                   | 23-25 | 1     | 2503.541 | 15" RC PIPE SEWER DESIGN 3006 CLASS IV                          | LIN FT   | 819                                       |
|                                   | 23-25 | 1     | 2503.541 | 18" RC PIPE SEWER DESIGN 3006 CLASS IV                          | LIN FT   | 20                                        |
|                                   | 23-25 | 1     | 2503.541 | 21" RC PIPE SEWER DESIGN 3006 CLASS IV                          | LIN FT   | 841                                       |
|                                   | 23-25 | 1     | 2503.541 | 24" RC PIPE SEWER DESIGN 3006 CLASS IV                          | LIN FT   | 28                                        |
|                                   | 23-25 | 1     | 2503.541 | 30" RC PIPE SEWER DESIGN 3006 CLASS IV                          | LIN FT   | 555                                       |
|                                   | 23-25 | 2     | 2506.502 | CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL                     | EACH     | 4                                         |
|                                   | 23-25 | 2     | 2506.502 | CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL 1                   | EACH     | 5                                         |
|                                   | 23-25 | 2     | 2506.502 | CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL 2                   | EACH     | 9                                         |
|                                   | 23-25 | 2     | 2506.502 | CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL 3                   | EACH     | 4                                         |
|                                   | 23-25 | 2     | 2506.502 | CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL 4                   | EACH     | 3                                         |
|                                   | 23-25 | 2     | 2506.502 | CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL 5                   | EACH     | 1                                         |
|                                   | 23-25 | 2     | 2506.502 | CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL 6                   | EACH     | 2                                         |
|                                   | 23-25 |       | 2506.502 | RAIN GUARDIAN                                                   | EACH     | 3                                         |
|                                   |       |       | 2506.602 | ADJUST DRAINAGE STRUCTURE                                       | EACH     | 1                                         |
| BN                                | 4     |       | 2511.504 | GEOTEXTILE FILTER TYPE 4                                        | SQ YD    | 93                                        |
| BL                                | 4     |       | 2511.507 | RANDOM RIPRAP CLASS III                                         | CU YD    | 19                                        |
| BE                                | 4     |       | 2531.501 | CONCRETE CURB & GUTTER DESIGN D312 (MODIFIED)                   | LIN FT   | 8200                                      |
| BA                                | 4     | 8     | 2531.507 | 6" CONCRETE DRIVEWAY PAVEMENT                                   | SQ YD    | 384                                       |
| AD, BF                            | 3-4   | 10    | 2540.602 | RELOCATE MAIL BOX SUPPORT                                       | EACH     | 35                                        |
|                                   |       |       | 2563.601 | TRAFFIC CONTROL                                                 | LUMP SUM | 1                                         |
| BH                                | 4     | 6     | 2564.518 | SIGN PANELS TYPE C                                              | SQ FT    | 73                                        |
|                                   | 26    | 7     | 2573.501 | STABILIZED CONSTRUCTION EXIT                                    | LUMP SUM | 1                                         |
| BI                                |       | 7     | 2573.502 | SILT FENCE, TYPE MACHINE SLICED                                 | LIN FT   | 5038                                      |
| BJ                                |       | 7     | 2573.502 | STORM DRAIN INLET PROTECTION                                    | EACH     | 36                                        |
| BK                                |       | 7     | 2573.502 | CULVERT END CONTROLS                                            | EACH     | 8                                         |
| BM                                |       | 7     | 2573.503 | SEDIMENT CONTROL LOG TYPE STRAW                                 | LIN FT   | 263                                       |
| BG                                |       | 7     | 2575.504 | EROSION CONTROL BLANKETS CATEGORY D                             | SQ YD    | 424                                       |
|                                   | 26-28 | 3     | 2575.605 | TURF ESTABLISHMENT                                              | ACRE     | 2.5                                       |

NOTES:

1. SELECT GRANULAR BORROW, STRUCTURAL EXCAVATION, AND GRANULAR BACKFILL FOR STORM PIPES ARE INCIDENTAL.
2. FILTER FABRIC AND FABRIC WRAP FOR MANHOLES ARE INCIDENTAL.
3. ALL DISTURBED AREAS DETERMINED NOT TO BE PAVED, AGGREGATE SURFACE, CONCRETE SURFACE OR RIPRAPPED SHALL HAVE 4 INCHES OF TOPSOIL, FERTILIZER TYPE 2, MULCH MATERIAL, AND SEED MIXTURES NO. 34-181, MULCH TYPE 3 (WEED FREE MULCH) WITH NO FERTILIZER AND 25-151 PER MNDOT STANDARD SPECIFICATION 3876, APPLY TYPE 1 MULCH AT THE RATE OF 2 (TWO) TONS PER ACRE (TO ACHIEVE A 90% UNIFORM GROUND COVERAGE). SEED MIXTURE, WATER, TYPE 2 FERTILIZER, MULCH, AND DISK ANCHORING ARE INCIDENTAL. SOIL TESTING TO DETERMINE FERTILIZER MIXTURE RATIO AND RATE OF APPLICATION IS INCIDENTAL.
4. MATERIAL FOUND IN THE SUBCUTS THAT IS UNSUITABLE FOR FILL IN THE ROADBED SHALL BE REMOVED OFF-SITE.
5. THE CONTRACTOR SHALL NOT DISTURB AREAS OUTSIDE THE CONSTRUCTION LIMITS.
6. SIGNS INCLUDE POSTS.
7. INSTALLATION AND MAINTENANCE ARE INCIDENTAL.
8. QUANTITY SHOWN USED FOR DRIVEWAY CONSTRUCTION. SEE DETAIL RFC-363A3.
9. BITUMINOUS MATERIAL FOR TACK COAT SHALL BE INCIDENTAL.
10. REMOVE SUPPORTS AND SALVAGE MAIL BOXES. SALVAGE MAIL BOXES ARE INCIDENTAL.
11. AVERAGE DEPTH OF EXISTING BITUMINOUS PAVEMENT IS 3" TO 4".

SEED MIX 25-151: RESIDENTIAL TURF  
MULCH TYPE 1  
PLANT APRIL 1ST - JUNE 1ST FOR SPRING PLANTING OR JULY 20TH - SEPTEMBER 20TH FOR FALL PLANTING

SEED MIX 34-181: EMERGENT WETLAND  
MULCH TYPE 3  
PLANT APR 15TH - JUL 20TH FOR SPRING PLANTING OR SEPT 20TH - OCT 20TH FOR FALL PLANTING

| PLATE NO.  | STANDARD PLATES - RFC ENGINEERING (IN THE PLANS)              |
|------------|---------------------------------------------------------------|
| RFC-355A   | CONCRETE CURB AND GUTTER                                      |
| RFC-363A3  | PRIVATE DRIVEWAY/FIELD ENTRANCE                               |
| RFC-366E3  | TYPICAL STREET SECTION                                        |
| RFC-366E15 | TYPICAL STREET SECTION                                        |
| RFC-367A   | RESIDENTIAL CUL-DE-SAC                                        |
| RFC-380A   | CURB END                                                      |
| RFC-459B   | RECTANGULAR CATCH BASIN                                       |
| RFC-463    | FABRIC AROUND CATCH BASIN                                     |
| RFC-465A1  | RECTANGULAR INLET FOR ROUND MANHOLE                           |
| RFC-465A2  | RECTANGULAR INLET FOR ROUND MANHOLE - 4' SUMP                 |
| RFC-465B3  | RECTANGULAR INLET FOR ROUND MANHOLE - VARIABLE SUMP HEIGHT    |
| RFC-465C1  | ROUND INLET FOR ROUND MANHOLE                                 |
| RFC-466B   | RCP TRASH GUARD                                               |
| RFC-466C   | CPP TRASH GUARD                                               |
| RFC-654    | STORM DRAIN BEDDING FOR RIGID AND FLEXIBLE PIPE *MNDOT DETAIL |
| RFC-857    | SILT FENCE AT FES                                             |

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY

| PLATE NO. | MNDOT STANDARD PLATES                        |
|-----------|----------------------------------------------|
| 3000L     | REINFORCED CONCRETE PIPE (5 SHEETS)          |
| 3006G     | GASKET JOINT FOR R.C. PIPE (2 SHEETS)        |
| 3100G     | CONCRETE APRON FOR R.C. PIPE                 |
| 3129A     | METAL APRON FOR CORRUGATED POLYETHYLENE PIPE |
| 3133D     | RIPRAP AT R.C. PIPE OUTLETS                  |
| 3134D     | RIPRAP AT CSP OUTLET                         |
| 3145G     | CONCRETE PIPE TIES                           |
| 7100H     | CONCRETE CURB & GUTTER                       |
| 8000J     | CHANNELIZERS (3 SHEETS)                      |
| 9350A     | MAILBOX SUPPORT (SWING-AWAY TYPE)            |

BASIS FOR ESTIMATED QUANTITIES

AGGREGATE BASE 105 LBS/S.Y./INCH  
BITUMINOUS MIXTURE 110 LBS/S.Y./INCH  
TACK COAT 0.05 GAL./S.Y.  
TYPE 1 MULCH 2 TONS/ACRE



| REMOVE SIGN |                   |          |        |          | AA           |
|-------------|-------------------|----------|--------|----------|--------------|
| STATION     | LOCATION          | SIGN NO. | POST   | CODE NO. | PANEL LEGEND |
| 10+30       | 159TH AVE. - LT   | C-20     | SINGLE |          | STREET       |
| 10+36       | 159TH AVE. - LT   | C-21     | SINGLE | R1-1     | STOP         |
| 14+49       | 159TH AVE. - LT   | C-20     | SINGLE |          | STREET       |
| 14+73       | 159TH AVE. - RT   | C-22     | SINGLE | W1-7     | DOUBLE ARROW |
| 19+74       | 159TH AVE. - LT   | C-20     | SINGLE |          | STREET       |
| 30+31       | 160TH LN. - LT    | C-21     | SINGLE | R1-1     | STOP         |
| 30+36       | 160TH LN. - RT    | C-20     | SINGLE |          | STREET       |
| 31+23       | 160TH LN. - RT    | C-23     | SINGLE | R2-1-30  | SPEED LIMIT  |
| 43+18       | 160TH LN. - RT    | C-20     | SINGLE |          | STREET       |
| 58+54       | ZUMBROTA ST. - RT | C-20     | SINGLE |          | STREET       |
| 72+59       | 160TH AVE. - LT   | C-24     | SINGLE | W14-1    | DEAD END     |
| 72+73       | 160TH AVE. - RT   | C-20     | SINGLE |          | STREET       |
|             |                   | TOTAL    | 12     |          |              |

| REMOVE CULVERTS |         |                     |                  | AB |
|-----------------|---------|---------------------|------------------|----|
| STATION         | SIZE    | LOCATION            | LENGTH (LIN. FT) |    |
| 10+29           | 12" CMP | 159TH AVE. - ACROSS | 50               |    |
| 12+77           | 18" CMP | 159TH AVE. - ACROSS | 59               |    |
| 14+58           | 18" CMP | 15TH AVE. - RT      | 18               |    |
| 30+28           | 12" CMP | 160TH LN. - ACROSS  | 50               |    |
| TOTAL           |         |                     | 177              |    |

| REMOVE BITUMINOUS PAVEMENT |                           |          | AC |
|----------------------------|---------------------------|----------|----|
| STATION                    | LOCATION                  | SQ. YD.  |    |
| 10+14.81 TO 20+60.79       | 159TH AVENUE - ROADWAY    | 2,629.5  |    |
| 60+00.00 TO 66+73.70       | ALAMO STREET - ROADWAY    | 2,265.5  |    |
| 50+00.00 TO 58+94.17       | ZUMBROTA STREET - ROADWAY | 2,204.6  |    |
| 70+00.00 TO 72.98.04       | 160TH AVENUE - ROADWAY    | 1,407.4  |    |
| 30+14.33 TO 43+34.36       | 160TH LANE - ROADWAY      | 3,389.1  |    |
| TOTAL                      |                           | 11,896.2 |    |

| REMOVE MAILBOX SUPPORT |                   |        | AD |
|------------------------|-------------------|--------|----|
| STATION                | LOCATION          | TYPE   |    |
| 11+24                  | 159TH AVE. - LT   | SINGLE |    |
| 11+69                  | 159TH AVE. - LT   | SINGLE |    |
| 11+83                  | 159TH AVE. - LT   | SINGLE |    |
| 15+33                  | 159TH AVE. - LT   | SINGLE |    |
| 16+56                  | 159TH AVE. - LT   | DOUBLE |    |
| 17+42                  | 159TH AVE. - LT   | SINGLE |    |
| 31+03                  | 160TH LN. - RT    | SINGLE |    |
| 32+15                  | 160TH LN. - RT    | SINGLE |    |
| 33+43                  | 160TH LN. - RT    | SINGLE |    |
| 34+40                  | 160TH LN. - RT    | SINGLE |    |
| 36+47                  | 160TH LN. - LT    | DOUBLE |    |
| 37+61                  | 160TH LN. - RT    | SINGLE |    |
| 38+50                  | 160TH LN. - RT    | SINGLE |    |
| 39+61                  | 160TH LN. - RT    | SINGLE |    |
| 39+67                  | 160TH LN. - LT    | SINGLE |    |
| 41+44                  | 160TH LN. - RT    | SINGLE |    |
| 41+52                  | 160TH LN. - LT    | SINGLE |    |
| 51+66                  | ZUMBROTA ST. - LT | SINGLE |    |
| 52+95                  | ZUMBROTA ST. - LT | SINGLE |    |
| 53+20                  | ZUMBROTA ST. - LT | SINGLE |    |
| 53+73                  | ZUMBROTA ST. - LT | SINGLE |    |
| 55+43                  | ZUMBROTA ST. - LT | SINGLE |    |
| 57+03                  | ZUMBROTA ST. - LT | SINGLE |    |
| 61+83                  | ALAMO ST. - LT    | SINGLE |    |
| 63+21                  | ALAMO ST. - LT    | SINGLE |    |
| 63+79                  | ALAMO ST. - LT    | DOUBLE |    |
| 64+42                  | ALAMO ST. - LT    | SINGLE |    |
| 65+31                  | ALAMO ST. - LT    | SINGLE |    |
| 66+03                  | ALAMO ST. - RT    | SINGLE |    |
| 66+06                  | ALAMO ST. - LT    | SINGLE |    |
| 70+52                  | 160TH AVE. - RT   | DOUBLE |    |
| TOTAL                  |                   | 35     |    |

| SAWCUT BITUMINOUS PAVEMENT |                      |          | AE |
|----------------------------|----------------------|----------|----|
| STATION                    | LOCATION             | LIN. FT. |    |
| 10+14.81                   | 159TH AVE. - ROADWAY | 66.6     |    |
| 20+60.79                   | 159TH AVE. - ROADWAY | 26.2     |    |
| 30+14.39                   | 160TH LN. - ROADWAY  | 66.5     |    |
| 43+34.13                   | 160TH LN. - ROADWAY  | 71.5     |    |
| TOTAL                      |                      | 230.8    |    |

| SALVAGE BRICK PAVERS |                            |         | AF |
|----------------------|----------------------------|---------|----|
| STATION              | LOCATION                   | SQ. FT. |    |
| 53+39                | ZUMBROTA ST. DRIVEWAY - LT | 388     |    |
| TOTAL                |                            | 388     |    |

| REINSTALL BRICK PAVERS |                            |         | AG |
|------------------------|----------------------------|---------|----|
| STATION                | LOCATION                   | SQ. FT. |    |
| 53+39                  | ZUMBROTA ST. DRIVEWAY - LT | 327     |    |
| TOTAL                  |                            | 327     |    |

| REMOVE CHAIN LINK FENCE |                 |          | AH |
|-------------------------|-----------------|----------|----|
| STATION                 | LOCATION        | LIN. FT. |    |
| 70+92 TO 72+24          | 160TH AVE. - RT | 132      |    |
| TOTAL                   |                 | 132      |    |

| REMOVE BITUMINOUS FLUME |                    |      | AI |
|-------------------------|--------------------|------|----|
| STATION                 | LOCATION           | EACH |    |
| 14+50                   | 159TH AVE. - RT.   | 1    |    |
| 55+00                   | ZUMBROTA ST. - RT. | 1    |    |
| 66+30                   | ALAMO ST. - LT.    | 1    |    |
| 70+35                   | 160TH AVE. - LT.   | 1    |    |
| TOTAL                   |                    | 4    |    |

NOTES

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2. BITUMINOUS AND CONCRETE DISTURBED BY CONSTRUCTION SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF OFFSITE IN ACCORDANCE WITH MnDOT SPEC. 2104.3C3.
3. COMPACTION OF ALL GRADING AND BASE ITEMS SHALL BE BY THE "QUALITY COMPACTION METHOD".
4. USE TACK COAT BETWEEN ALL BITUMINOUS LAYERS AND BETWEEN BITUMINOUS AND CONCRETE CURB AND GUTTER.
5. STRIP ALL TOPSOIL AREAS TO BE DISTURBED BY CONSTRUCTION AND REUSE TOPSOIL OR USE AS FILL OUTSIDE OF ROAD CORE.
6. WHENEVER THE WORD "INCIDENTAL" IS USED IN THIS PLAN, IT SHALL MEAN THIS WORK SHALL BE INCIDENTAL FOR WHICH NO DIRECT COMPENSATION WILL BE MADE.
7. STATIONING FOR LOCATION OF EXISTING AND NEW SIGNS IS APPROXIMATE.
8. EXCESS MATERIAL TO BE HAULED AWAY TO CITY OF HAM LAKE PUBLIC WORKS.

| EARTHWORK SUMMARY                                                                                                                                 |  | AJ                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>EXCAVATION (CU. YD.)</p> <p>TOPSOIL 2,172 CU YD (EV)</p> <p>COMMON 2,298 CU YD (EV)</p> <p>EIT REMOVAL 991 CU YD</p> <p>4,470 CU YD (EV) ①</p> |  | <p>EMBANKMENT (CU. YD.)</p> <p>TOPSOIL 1,461 CU YD (EV)/1.1 = 1,328 CU YD (CV)</p> <p>COMMON EX 2,298 CU YD (EV)/1.3 = 1,768 CU YD (CV)</p> <p>GRANULAR FILL 750 CY YD (CV)</p> <p>3,846 CU YD (CV) ②</p> <p>1,328 CU YD (CV) TOPSOIL</p> <p>2,518 CU YD (CV) COMMON</p> |
| <p>NOTES:</p> <p>① TOTAL EXCAVATION (EV) REQUIRED FOR PROJECT.</p> <p>② TOTAL EMBANKMENT (CV) REQUIRED FOR PROJECT.</p>                           |  |                                                                                                                                                                                                                                                                          |

| RESIDENTIAL DRIVEWAYS |          |               |       |         |               |       |              |       | BA    |
|-----------------------|----------|---------------|-------|---------|---------------|-------|--------------|-------|-------|
| STATION               | LOCATION | REMOVE (S.Y.) |       |         | SAWCUT (L.F.) |       | PLACE (S.Y.) |       |       |
|                       |          | CONC          | BIT   | GRAVEL* | CONC          | BIT   | CONC         | BIT   | CLS   |
| 11+82                 | RT.      | 29.2          |       |         | 15.9          |       | 28.4         |       |       |
| 12+38                 | LT.      |               | 13.5  |         |               | 15.3  |              | 12.6  | 12.6  |
| 15+50                 | RT.      | 58.7          |       |         | 16.3          |       | 56.6         |       |       |
| 16+80                 | LT.      |               | 46.6  |         |               | 18.5  |              | 30.3  | 30.3  |
| 16+80                 | RT.      |               | 14.8  |         |               | 12.3  |              | 17.8  | 17.8  |
| 17+64                 | RT.      |               |       | 42.4    |               |       |              | 38.1  | 38.1  |
| 31+10                 | LT.      |               | 14.8  |         |               | 19.2  |              | 13.4  | 13.4  |
| 32+00                 | RT.      |               | 16.7  |         |               | 18.1  |              | 12.8  | 12.8  |
| 33+67                 | LT.      |               | 13.1  |         |               | 18.6  |              | 12.2  | 12.2  |
| 34+11                 | RT.      | 57.9          |       |         | 17.6          |       | 52.8         |       |       |
| 36+25                 | RT.      |               | 82.5  |         |               | 18.6  |              | 76.2  | 76.2  |
| 36+25                 | LT.      |               | 13.2  |         |               | 16.7  |              | 12.0  | 12.0  |
| 37+43                 | LT.      |               | 26.1  |         |               | 15.6  |              | 24.0  | 24.0  |
| 38+67                 | RT.      |               | 31.1  |         |               | 19.5  |              | 25.7  | 25.7  |
| 39+50                 | RT.      |               | 40.9  |         |               | 18.5  |              | 36.0  | 36.0  |
| 40+00                 | LT.      |               | 20.1  |         |               | 23.3  |              | 13.8  | 13.8  |
| 41+27                 | LT.      |               | 23.8  |         |               | 27.8  |              | 16.1  | 16.1  |
| 41+65                 | RT.      |               | 43.7  |         |               | 17.8  |              | 39.0  | 39.0  |
| 51+08                 | RT.      |               |       | 24.7    |               |       |              | 24.1  | 24.1  |
| 51+88                 | LT.      | 50.0          |       |         | 16.1          |       | 49.5         |       |       |
| 53+00                 | RT.      |               | 57.9  |         |               | 17.6  |              | 54.2  | 54.2  |
| 53+39                 | LT.      | 8.6           |       |         |               |       | 12.3         |       |       |
| 55+62                 | RT.      | 67.8          |       |         | 24.5          |       | 61.2         |       |       |
| 58+87                 | LT.      |               | 56.7  |         |               | 19.2  |              | 51.3  | 51.3  |
| 61+58                 | RT.      | 27.0          |       |         | 20.6          |       | 25.1         |       |       |
| 61+58                 | LT.      | 67.2          |       |         | 17.3          |       | 61.6         |       |       |
| 63+33                 | LT.      |               | 15.1  |         |               | 11    |              | 10.2  | 10.2  |
| 63+66                 | RT.      |               | 24.0  |         |               | 13.5  |              | 21.1  | 21.1  |
| 64+26                 | RT.      | 44.5          |       |         | 17            |       | 36.6         |       |       |
| 65+50                 | LT.      |               | 18.1  |         |               | 16.9  |              | 13.9  | 13.9  |
| 66+23                 | RT.      |               |       |         |               |       |              | 28.9  | 28.9  |
| 66+74                 | LT.      |               | 78.7  |         |               | 15.5  |              | 81.7  | 81.7  |
| 66+85                 | RT.      |               | 60.6  |         |               | 19.6  |              | 70.5  | 70.5  |
| 69+75                 | LT.      |               | 9.5   |         |               | 15.2  |              | 22.0  | 22.0  |
| 69+83                 | RT.      |               | 11.7  |         |               | 16.7  |              | 25.2  | 25.2  |
| TOTAL                 |          | 410.9         | 732.9 | 67.1    | 145.3         | 405.0 | 384.1        | 783.3 | 783.3 |

\*GRAVEL INCLUDED IN COMMON EXCAVATION

| AGGREGATE BASE CLASS 5 |                           | BB      |
|------------------------|---------------------------|---------|
| STATION TO STATION     | LOCATION                  | TON     |
| 10+14.81 TO 20+60.79   | 159TH AVENUE - ROADWAY    | 656.7   |
| 60+00.00 TO 66+73.70   | ALAMO STREET - ROADWAY    | 524.5   |
| 50+00.00 TO 58+94.17   | ZUMBROTA STREET - ROADWAY | 542.8   |
| 70+00.00 TO 72+98.04   | 160TH AVENUE - ROADWAY    | 295.1   |
| 30+14.33 TO 43+34.36   | 160TH LANE - ROADWAY      | 831.1   |
| TOTAL                  |                           | 2,850.3 |

NOTES:

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- SIGN AND POST INSTALLED BY OTHERS

| TYPE SP 9.5 BITUMINOUS WEARING COURSE MIXTURE (SPWEA240C) |                           |                | BC    |
|-----------------------------------------------------------|---------------------------|----------------|-------|
| STATION TO STATION                                        | LOCATION                  | SQ. YD. (1 IN) | TON   |
| 10+14.81 TO 20+60.79                                      | 159TH AVENUE - ROADWAY    | 2842.9         | 172.0 |
| 30+14.39 TO 43+19.39                                      | 160TH LANE - ROADWAY      | 3597.7         | 217.7 |
| 50+12.00 TO 58+70.00                                      | ZUMBROTA STREET - ROADWAY | 2349.9         | 142.2 |
| 60+12.00 TO 67+13.70                                      | ALAMO STREET - ROADWAY    | 2270.7         | 137.4 |
| 69+60 TO 72+86.04                                         | 160TH AVENUE - ROADWAY    | 1277.6         | 77.3  |
| TOTAL                                                     |                           |                | 746.6 |

| TYPE SP 12.5 BITUMINOUS WEARING COURSE MIXTURE (SPWEB240C) |                           |                | BD      |
|------------------------------------------------------------|---------------------------|----------------|---------|
| STATION TO STATION                                         | LOCATION                  | SQ. YD. (2 IN) | TON     |
| 10+14.81 TO 20+60.79                                       | 159TH AVENUE - ROADWAY    | 2842.9         | 344.0   |
| 30+14.39 TO 43+19.39                                       | 160TH LANE - ROADWAY      | 3597.7         | 435.3   |
| 50+12.00 TO 58+70.00                                       | ZUMBROTA STREET - ROADWAY | 2349.9         | 284.3   |
| 60+12.00 TO 67+13.70                                       | ALAMO STREET - ROADWAY    | 2270.7         | 274.8   |
| 69+60 TO 72+86.04                                          | 160TH AVENUE - ROADWAY    | 1277.6         | 154.6   |
| TOTAL                                                      |                           |                | 1,493.0 |

| CONCRETE CURB & GUTTER DESIGN D312 MODIFIED |                   | BE      |
|---------------------------------------------|-------------------|---------|
| STATION TO STATION                          | LOCATION          | LIN FT  |
| 10+67.37 TO 14+35.57                        | 159TH AVE. - LT   | 374.1   |
| 10+67.37 TO 2060.79                         | 159TH AVE. - RT   | 984.9   |
| 15+08.35 TO 19+55.00                        | 159TH AVE. - LT   | 442.3   |
| 20+25.00 TO 20+60.79                        | 159TH AVE. - LT   | 37.2    |
| TOTAL NEEDED                                | 159TH AVE.        | 1,838.5 |
| 30+68.80 TO 34+91.19                        | 160TH LN. - RT    | 422.4   |
| 30+68.80 TO 43+34.13                        | 160TH LN. - LT    | 1,279.6 |
| 35+29.13 TO 43+34.13                        | 160TH LN. - RT    | 780.0   |
| TOTAL NEEDED                                | 160TH LN.         | 2,482.0 |
| 50+12 TO 58+70.00                           | ZUMBROTA ST. - RT | 894.1   |
| 50+12 TO 54+74.20                           | ZUMBROTA ST. - LT | 465.0   |
| 55+52.25 TO 58+70.00                        | ZUMBROTA ST. - LT | 331.6   |
| TOTAL NEEDED                                | ZUMBROTA ST.      | 1,690.7 |
| 60+12.00 TO 67+13.70                        | ALAMO ST. - BOTH  | 1,446.3 |
| 69+60.00 TO 72+86.04                        | 160TH AVE. - BOTH | 742.6   |
| TOTAL                                       |                   | 8,200.1 |

| MAILBOX SUPPORT (SWING-AWAY TYPE) |                   | BF     |
|-----------------------------------|-------------------|--------|
| STATION                           | LOCATION          | TYPE   |
| 11+24                             | 159TH AVE. - LT   | SINGLE |
| 11+69                             | 159TH AVE. - LT   | SINGLE |
| 11+83                             | 159TH AVE. - LT   | SINGLE |
| 15+33                             | 159TH AVE. - LT   | SINGLE |
| 16+56                             | 159TH AVE. - LT   | DOUBLE |
| 17+42                             | 159TH AVE. - LT   | SINGLE |
| 31+03                             | 160TH LN. - RT    | SINGLE |
| 32+15                             | 160TH LN. - RT    | SINGLE |
| 33+43                             | 160TH LN. - RT    | SINGLE |
| 34+40                             | 160TH LN. - RT    | SINGLE |
| 36+47                             | 160TH LN. - LT    | DOUBLE |
| 37+61                             | 160TH LN. - RT    | SINGLE |
| 38+50                             | 160TH LN. - RT    | SINGLE |
| 39+61                             | 160TH LN. - RT    | SINGLE |
| 39+67                             | 160TH LN. - LT    | SINGLE |
| 41+44                             | 160TH LN. - RT    | SINGLE |
| 41+52                             | 160TH LN. - LT    | SINGLE |
| 51+66                             | ZUMBROTA ST. - LT | SINGLE |
| 52+95                             | ZUMBROTA ST. - LT | SINGLE |
| 53+20                             | ZUMBROTA ST. - LT | SINGLE |
| 53+73                             | ZUMBROTA ST. - LT | SINGLE |
| 55+43                             | ZUMBROTA ST. - LT | SINGLE |
| 57+03                             | ZUMBROTA ST. - LT | SINGLE |
| 61+83                             | ALAMO ST. - LT    | SINGLE |
| 63+21                             | ALAMO ST. - LT    | SINGLE |
| 63+79                             | ALAMO ST. - LT    | DOUBLE |
| 64+42                             | ALAMO ST. - LT    | SINGLE |
| 65+31                             | ALAMO ST. - LT    | SINGLE |
| 66+03                             | ALAMO ST. - RT    | SINGLE |
| 66+06                             | ALAMO ST. - LT    | SINGLE |
| 70+52                             | 160TH AVE. - RT   | DOUBLE |
| TOTAL                             |                   | 35     |

| EROSION CONTROL BLANKET |                 | BG      |
|-------------------------|-----------------|---------|
| STATION                 | LOCATION        | SQ. YD. |
| 10+28                   | 159TH AVE. - RT | 8.9     |
| 30+28                   | 160TH AVE. - RT | 9.0     |
| 40+50                   | 160TH AVE. - RT | 278.4   |
| 65+00                   | ALAMO ST. - RT  | 127.6   |
| TOTAL                   |                 | 423.9   |

| SIGN PANELS TYPE C |      |            |        |           |                |                      | BH       |              |
|--------------------|------|------------|--------|-----------|----------------|----------------------|----------|--------------|
| SIGN NO.           | NOTE | TOTAL QTY. | POST   | PANEL     |                |                      | CODE NO. | PANEL LEGEND |
|                    |      |            |        | SIZE (IN) | AREA (SQ. FT.) | TOTAL AREA (SQ. FT.) |          |              |
| C-1                |      | 3          | SINGLE | 30 X 30   | 6.25           | 18.8                 | R1-1     | STOP         |
| C-2                | 8    | 7          | SINGLE | HAM LAKE  |                |                      |          | STREET       |
| C-3                |      | 2          | SINGLE | 24 X 30   | 5              | 10.0                 | R2-1-30  | SPEED LIMIT  |
| C-4                |      | 4          | SINGLE | 48 X 24   | 8              | 32.0                 | W1-7     | DOUBLE ARROW |
| C-5                |      | 2          | SINGLE | 30 X 30   | 6.25           | 12.5                 | W14-1    | DEAD END     |
| TOTAL              |      |            |        |           |                | 73.3                 |          |              |

| SILT FENCE         |                    | BI       |
|--------------------|--------------------|----------|
| STATION TO STATION | LOCATION           | LIN. FT. |
| 10+31 TO 11+69     | 159TH AVE - RT.    | 162.3    |
| 11+86 TO 13+79     | 159TH AVE - RT.    | 168.1    |
| 12+00 TO 14+33     | 159TH AVE - LT.    | 236.8    |
| 14+18 TO 15+50     | 159TH AVE - RT.    | 131.8    |
| 15+02 TO 15+61     | 159TH AVE - LT.    | 68.9     |
| 16+91 TO 17+55     | 159TH AVE - RT.    | 69.6     |
| 17+80 TO 20+59     | 159TH AVE - RT.    | 261.3    |
| 19+23 TO 19+79     | 159TH AVE - LT.    | 48.0     |
| 20+23 TO 20+58     | 159TH AVE - LT.    | 37.1     |
| 30+15 TO 30+93     | 160TH LN - LT.     | 94.1     |
| 30+29 TO 31+84     | 160TH LN - RT.     | 170.8    |
| 31+26 TO 33+51     | 160TH LN - LT.     | 224.5    |
| 32+18 TO 32+80     | 160TH LN - RT.     | 61.2     |
| 33+85 TO 36+10     | 160TH LN - LT.     | 226.3    |
| 36+42 TO 37+31     | 160TH LN - LT.     | 88.2     |
| 37+60 TO 39+90     | 160TH LN - LT.     | 231.6    |
| 40+23 TO 41+07     | 160TH LN - LT.     | 92.7     |
| 41+50 TO 43+27     | 160TH LN - LT.     | 182.0    |
| 42+79 TO 43+27     | 160TH LN - RT.     | 71.6     |
| 50+27 TO 50+92     | ZUMBROTA ST. - RT. | 63.0     |
| 50+33 TO 51+69     | ZUMBROTA ST. - LT. | 116.1    |
| 51+17 TO 52+16     | ZUMBROTA ST. - RT. | 108.5    |
| 52+00 TO 53+23     | ZUMBROTA ST. - LT. | 120.2    |
| 53+50 TO 54+78     | ZUMBROTA ST. - LT. | 131.4    |
| 53+59 TO 55+40     | ZUMBROTA ST. - RT. | 210.8    |
| 55+47 TO 56+66     | ZUMBROTA ST. - LT. | 117.5    |
| 55+82 TO 56+23     | ZUMBROTA ST. - RT. | 40.0     |
| 57+07 TO 58+46     | ZUMBROTA ST. - LT. | 138.3    |
| 60+36 TO 61+17     | ALAMO ST. - LT.    | 73.9     |
| 60+36 TO 61+43     | ALAMO ST. - RT.    | 119.7    |
| 62+00 TO 63+24     | ALAMO ST. - LT.    | 124.6    |
| 63+37 TO 65+29     | ALAMO ST. - LT.    | 195.6    |
| 65+67 TO 66+55     | ALAMO ST. - LT.    | 112.4    |
| 66+30 TO 66+70     | ALAMO ST. - RT.    | 54.0     |
| 67+00 TO 67+45     | ALAMO ST. - BOTH   | 135.6    |
| 69+86 TO 72+66     | 160TH AVE. - LT.   | 279.1    |
| 69+96 TO 72+58     | 160TH AVE. - RT.   | 271.2    |
| TOTAL              |                    | 5,038.5  |

| STORM DRAIN INLET PROTECTION |                              | BJ       |
|------------------------------|------------------------------|----------|
| STATION                      | LOCATION                     | QUANTITY |
| 12+71                        | 159TH AVE. - BOTH            | 2        |
| 12+76                        | 159TH AVE. - LT              | 1        |
| 13+65                        | 159TH AVE. - RT              | 1        |
| 13+68                        | 159TH AVE. - LT              | 1        |
| 14+49                        | 159TH AVE. - LT              | 1        |
| 14+89                        | 159TH AVE. - LT              | 1        |
| 15+85                        | 159TH AVE. - BOTH            | 2        |
| 17+29                        | 159TH AVE. - LT              | 1        |
| 19+72                        | 159TH AVE. - LT              | 1        |
| 22+28                        | 159TH AVE. - RT              | 1        |
| 32+78                        | 160TH LN. - BOTH             | 2        |
| 34+78                        | 160TH LN. - BOTH             | 2        |
| 43+00                        | 160TH LN. - LT               | 1        |
| 51+50                        | ZUMBROTA ST. - LT            | 1        |
| 52+50                        | ZUMBROTA ST. - LT            | 1        |
| 54+72                        | ZUMBROTA ST. - BOTH          | 2        |
| 55+06                        | ZUMBROTA ST. - RT            | 1        |
| 55+33                        | ZUMBROTA ST. - BOTH          | 2        |
| 56+68                        | ZUMBROTA ST. - BOTH          | 2        |
| 57+60                        | ZUMBROTA ST. - BOTH          | 2        |
| 58+64                        | ZUMBROTA ST. - LT            | 1        |
| 61+08                        | ALAMO ST. - RT               | 1        |
| 66+65                        | ALAMO ST. - BOTH             | 2        |
| 70+65                        | 160TH AVE. - RT              | 1        |
| OUTSIDE CONST. LIMITS        | 160TH LN. & XYUTE ST. - BOTH | 2        |
| OUTSIDE CONST. LIMITS        | 160TH LN. & BATAAN ST. - RT  | 1        |
| TOTAL                        |                              | 36       |

| CULVERT END CONTROL |                   | BK       |
|---------------------|-------------------|----------|
| STATION             | LOCATION          | QUANTITY |
| 10+28               | 159TH AVE. - LT   | 2        |
| 14+88               | 159TH AVE. - RT   | 1        |
| 30+28               | 160TH AVE. - LT   | 2        |
| 55+47               | ZUMBROTA ST. - LT | 1        |
| 66+30               | ALAMO ST. - LT    | 1        |
| 67+27               | ALAMO ST. - END   | 1        |
| TOTAL               |                   | 8        |

| RIPRAP CLASS 3 |                 | BL      |
|----------------|-----------------|---------|
| STATION        | LOCATION        | CU. YD. |
| 13+65          | 159TH AVE. - RT | 12.3    |
| 66+29          | ALAMO ST. - LT  | 6.4     |
| TOTAL          |                 | 18.7    |

| SEDIMENT CONTROL LOG |                   | BM       |
|----------------------|-------------------|----------|
| STATION              | LOCATION          | LIN. FT. |
| 13+85 TO 15+00       | 159TH AVE. - RT   | 210.9    |
| 54+84 TO 55+07       | ZUMBROTA ST. - RT | 29.5     |
| 66+22 TO 66+29       | ALAMO ST. - LT    | 22.7     |
| TOTAL                |                   | 263.1    |

| GEOTEXTILE FABRIC |                   | BN      |
|-------------------|-------------------|---------|
| STATION           | LOCATION          | SQ. YD. |
| 13+65             | 159TH AVE. - RT   | 41.6    |
| 54+99             | ZUMBROTA ST. - RT | 25.6    |
| 66+29             | ALAMO ST. - LT    | 25.6    |
| TOTAL             |                   | 92.8    |



800-252-1166 651-454-0002

UTILITIES: CENTURYLINK (763) 712-5017  
CENTERPOINT ENERGY (763) 323-2760  
COMCAST (952) 607-4078  
CONNEXUS ENERGY (763) 323-4268  
XCEL ENERGY (612) 526-4508

DATE REVISION HISTORY

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
*Dave Krueger*  
DATE 5/10/2021 REG. NO. 48768

**RFC ENGINEERING, INC.**  
**Consulting Engineers**

13635 Johnson Street  
Ham Lake, MN 55304  
Telephone 763-862-8000  
Fax 763-862-8042

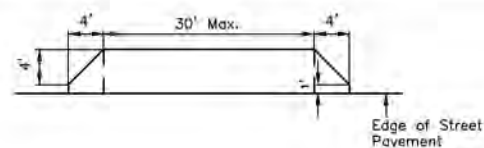
DESIGN BY: GJM DRAWN BY: GJM CHECKED BY: TPC

HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

TABULATIONS

DWG: 1907 TAB 2  
DATE: 05/06/21  
JOB NUMBER: 1907  
SHEET: 4 OF 44  
FILE: 35-1-133



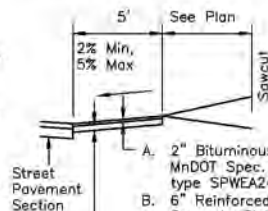


Note:

① Match existing driveway width and elevation at matchline unless otherwise directed by engineer (See Plans).

② If existing driveway is concrete, apron and driveway shall be constructed of 6" concrete with 6" x 6" - 6/6 welded wire fabric per MnDOT Spec. 2360 in flat sheets, not rolls. Epoxy coated dowel bars conforming to MnDOT Spec. 3302 shall be placed in the existing driveway pavement along the sawcut line. Dowel bars shall be properly coated with a MnDOT approved lubricant. Dowel bars shall be size #4 and placed at 24" OC. All work shall conform to MnDOT Spec. 2301 and 2531. Concrete shall be ready-mix 3,900 PSI at 28 days, with air content of 5% to 7%, coarse aggregate shall be 1" max, class A and per MnDOT Spec. 3137. Joint sealer shall be hot-poured, low modulus, mastic type per MnDOT Spec. 3725. Membrane curing compound shall be per MnDOT Specs. 3754 and 2301.3M.

③ If existing driveway is gravel, apron and driveway within R/W shall be constructed per existing bituminous driveways. Gravel driveways matching beyond R/W shall be 6" Class 5.

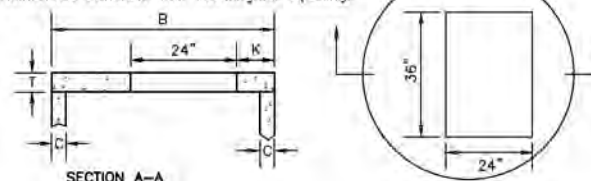


A. 2" Bituminous mat, MnDOT Spec. 2360 type SPWEA240C  
B. 6" Reinforced Concrete Slab, MnDOT Spec. 2301 and 2531  
A. 4" Class 5 Aggregate Base, MnDOT Spec. 2211  
B. 4" Suitable Base Material

④ If existing driveway is bituminous, apron and driveway behind apron shall be bituminous per A. above. All bituminous work shall conform to MnDOT Specifications 2112, 2211, 2357 and 2360. Tack coat is to be applied between concrete and bituminous surfaces.

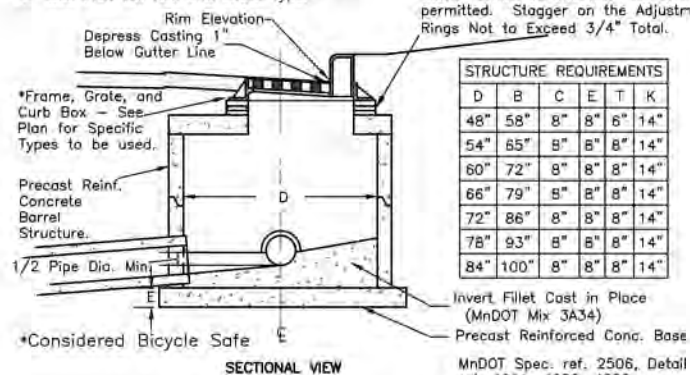
⑤ Driveways in fill sections to slope up from 1" curb lip to end of apron (5' from back of curb) at min of 2% then slope to matchline. See Plan for slope.

NOTE:  
HS20 Roadway Loading Catch Basin Cover Slab of Precast Reinforced Concrete with Rectangular Opening.



Note:

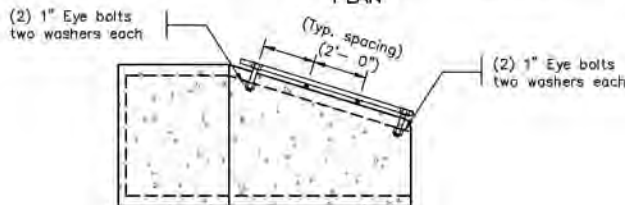
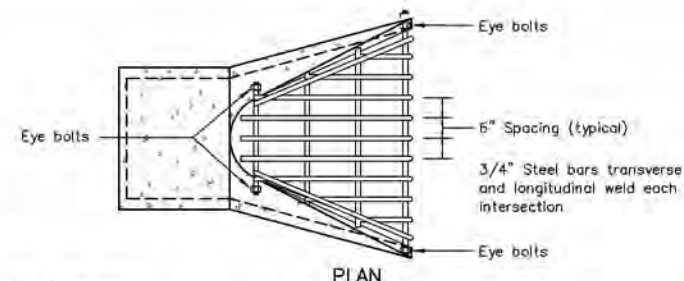
- Steps needed for structure height greater than 4'.
- Cover Slab to Rest on Bed of Mortar on Full Thickness of Structure Walls, not to Rest on Pipe Tongue or Groove.
- Location of Structure as Shown in Plans.
- See Plan for Box and Grate Type.



#### RECTANGULAR INLET FOR ROUND MANHOLE RFC-465A1

NOT TO SCALE

SPECIAL 2 = 48" Ø  
SPECIAL 3 = 54" Ø  
SPECIAL 4 = 66" Ø



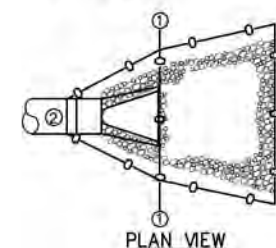
Note:

- Trash guard to be galvanized after fabrication
- The size of each trash guard will vary to fit the apron size.
- All bolts to be non-rusting stainless steel.
- Weld all bolts to prevent entry after final storm sewer cleaning.
- Round all steel bars such that ends are smooth and free of burrs.

FOR PIPE DIAMETERS 30" AND SMALLER

#### RCP TRASH GUARD RFC-466B

NOT TO SCALE

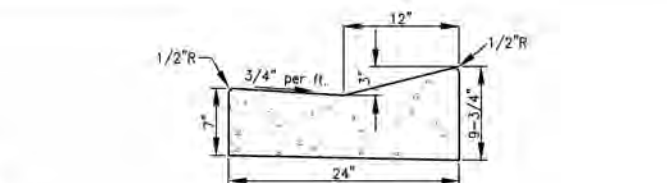


SEQUENCING:

- Place silt fence along construction limits, the portion of silt fence in front of the pipe shall be removed during flared end section placement.
- Once the flared end section is placed, silt fence shall be furnished and installed around the top of the flared end section and surrounding the riprap. Any additional outlet protection shall be added as required.
- Contractor may substitute silt fence for bio-roll or rock log to act as weir for flow into culvert.

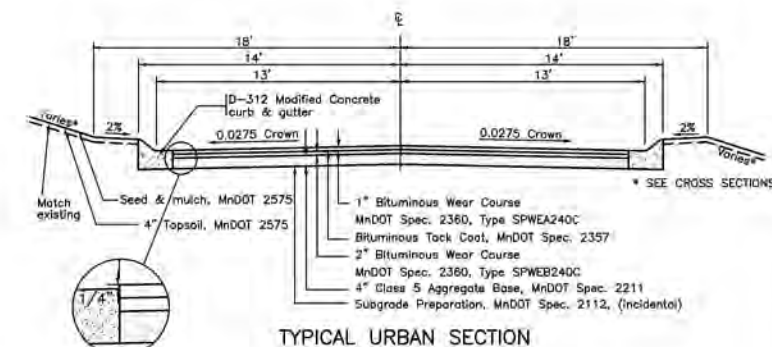
#### SILT FENCE AT FES RFC-857

NOT TO SCALE



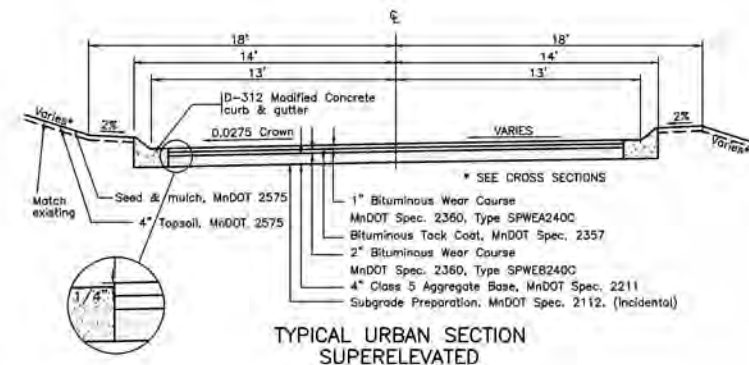
#### D312 MODIFIED CONCRETE CURB AND GUTTER RFC-355A

NOT TO SCALE



#### TYPICAL STREET SECTION RFC-366E3

NOT TO SCALE



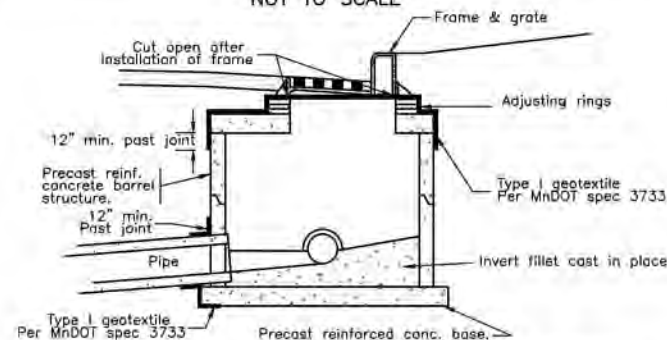
#### TYPICAL STREET SECTION RFC-366E15

NOT TO SCALE

160TH AVENUE FROM 69+70 TO 72+00 EAST BOUND LANE SUPER-ELEVATED  
ALAMO STREET FROM 65+30 TO 67+10 NORTH BOUND LANE SUPER-ELEVATED

#### PRIVATE DRIVEWAY/FIELD ENTRANCE RFC-363A3

NOT TO SCALE

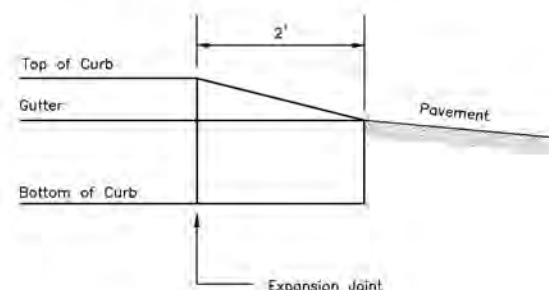


SEAL FABRIC ONTO CATCH BASIN AND CATCH BASIN MANHOLE WITH DUCT TAPE. OVER LAP ALL SEAMS. 12" MIN.

SECTIONAL VIEW

#### FABRIC AROUND CATCH BASIN RFC-463

NOT TO SCALE

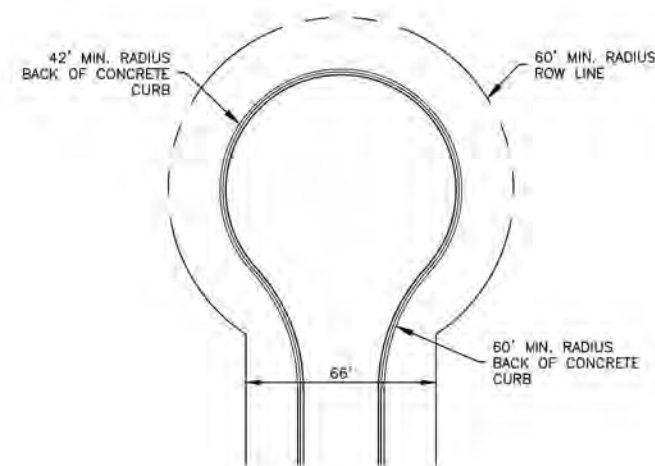


#### CURB END DETAIL RFC-380A

NOT TO SCALE

#### TYPICAL RESIDENTIAL CUL-DE-SAC RFC-367A

NOT TO SCALE



**Gopher State One Call**  
800-252-1166 651-454-0002

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CENTERPOINT ENERGY (763) 323-2760  
COMCAST (952) 607-4078  
CONNEXUS ENERGY (763) 323-4268  
XCEL ENERGY (612) 526-4508

DATE REVISION HISTORY

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
*Dave Krueger*  
DATE 5/10/2021 REG. NO. 48768

**RFC ENGINEERING, INC.**  
Consulting Engineers

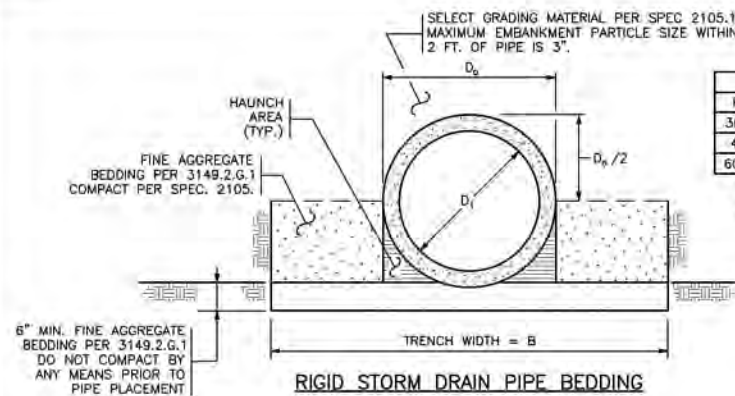
13635 Johnson Street  
Ham Lake, MN 55304  
Telephone 763-862-8000  
Fax 763-862-8042

HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

DETAILS

DESIGN BY: GJM DRAWN BY: GJM CHECKED BY: TPC

DWG: 1907 DETAIL 1  
DATE: 05/06/21  
JOB NUMBER: 1907  
SHEET: 5 OF 44  
FILE: 35-1-134



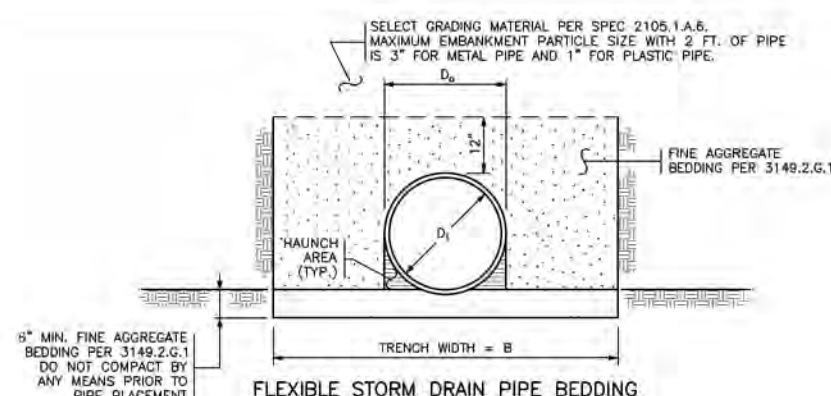
| TRENCH BASE WIDTH |                  |
|-------------------|------------------|
| PIPE DIA. $D_1$   | TRENCH WIDTH B   |
| 36" OR LESS       | $D_1 + 24"$      |
| 42" TO 54"        | $1.5 \times D_1$ |
| 60" OR OVER       | $D_1 + 36"$      |

#### CONSTRUCTION SEQUENCE

1. LOOSELY PLACE 6" OF FINE AGGREGATE BEDDING MATERIAL TO GRADE, DO NOT COMPACT PRIOR TO PIPE PLACEMENT.
2. FOR PIPES WITH BELL, REMOVE MATERIAL IN BELL AREA PRIOR TO PLACEMENT.
3. FURNISH AND INSTALL PIPE TO GRADE.
4. AFTER PLACEMENT OF THE PIPE, PLACE ADDITIONAL BEDDING AND COMPACT THE FULL LENGTH ON BOTH SIDES OF THE PIPE UNDERNEATH THE HAUNCH AREA BY FIRST SHOVEL SLICING (MANUALLY SHOVE THE BLADE END OF SHOVEL AT AN ANGLE DOWN THE ENTIRE LENGTH OF THE HAUNCH UNDER THE PIPE) THEN COMPACT THE HAUNCH AT AN ANGLE USING A POWERED MECHANICAL OR PNEUMATIC DEVICE (I.E. POLE TAMPER, JUMPING JACK, OR SIMILAR). COMPACT THE REMAINING MATERIAL OUTSIDE THE HAUNCH AREA TO THE REQUIREMENTS OF THE APPLICABLE MATERIAL TYPE ENSURING THAT THE ENTIRE LENGTH OF PIPE IS SUPPORTED UNIFORMLY BY BEDDING.
5. PLACE AND COMPACT BACKFILL EVENLY AND SIMULTANEOUSLY IN 6" LIFTS ON EACH SIDE OF THE PIPE UP TO THE MID-HEIGHT WHEN COMPACTED.
6. COMPLETE REMAINING BACKFILL.

#### NOTES

EXCAVATE & CONSTRUCT ALL TRENCHES AND SLOPES PER OSHA REQUIREMENTS.  
PIPE SIZE IS BASED ON THE NOMINAL INSIDE DIAMETER.  
PROTECT ALL PIPE DURING CONSTRUCTION PER SPEC. 2501 OR 2503.



| TRENCH BASE WIDTH |                  |
|-------------------|------------------|
| PIPE DIA. $D_1$   | TRENCH WIDTH B   |
| 36" OR LESS       | $D_1 + 24"$      |
| 42" TO 48"        | $1.5 \times D_1$ |

#### CONSTRUCTION SEQUENCE

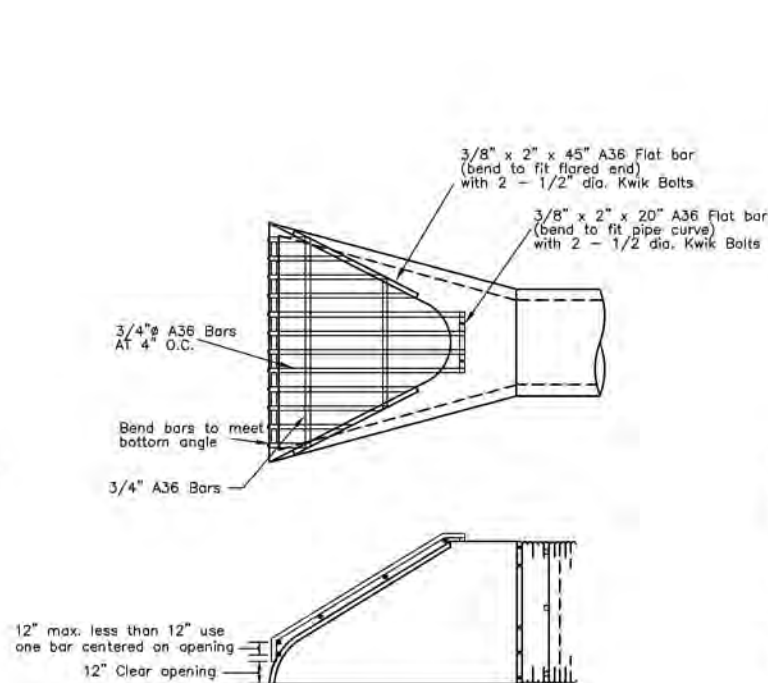
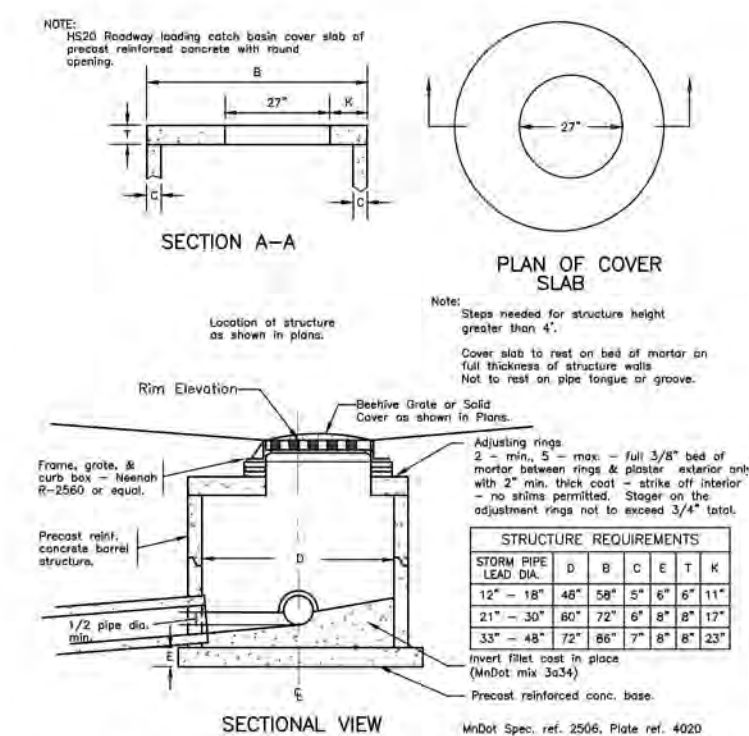
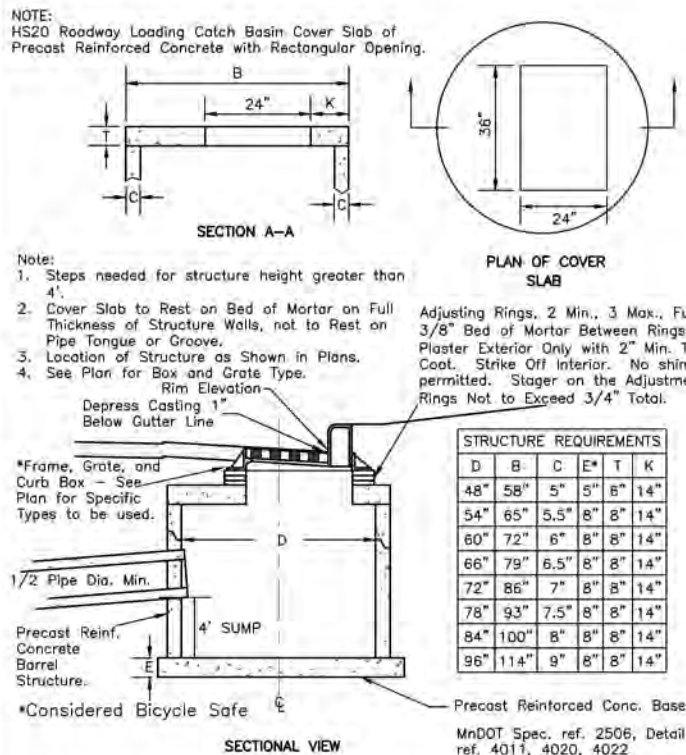
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2. FOR PIPES WITH BELL, REMOVE MATERIAL IN BELL AREA PRIOR TO PLACEMENT.
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5. PLACE AND COMPACT BACKFILL EVENLY AND SIMULTANEOUSLY IN 6" LIFTS ON EACH SIDE OF THE PIPE UP TO THE MID-HEIGHT WHEN COMPACTED.
6. COMPLETE REMAINING BACKFILL.

#### NOTES

EXCAVATE & CONSTRUCT ALL TRENCHES AND SLOPES PER OSHA REQUIREMENTS.  
PIPE SIZE IS BASED ON THE NOMINAL INSIDE DIAMETER.  
PROTECT ALL PIPE DURING CONSTRUCTION PER SPEC. 2501 OR 2503.

### STORM DRAIN BEDDING FOR RIGID AND FLEXIBLE PIPE RFC-654

NOT TO SCALE

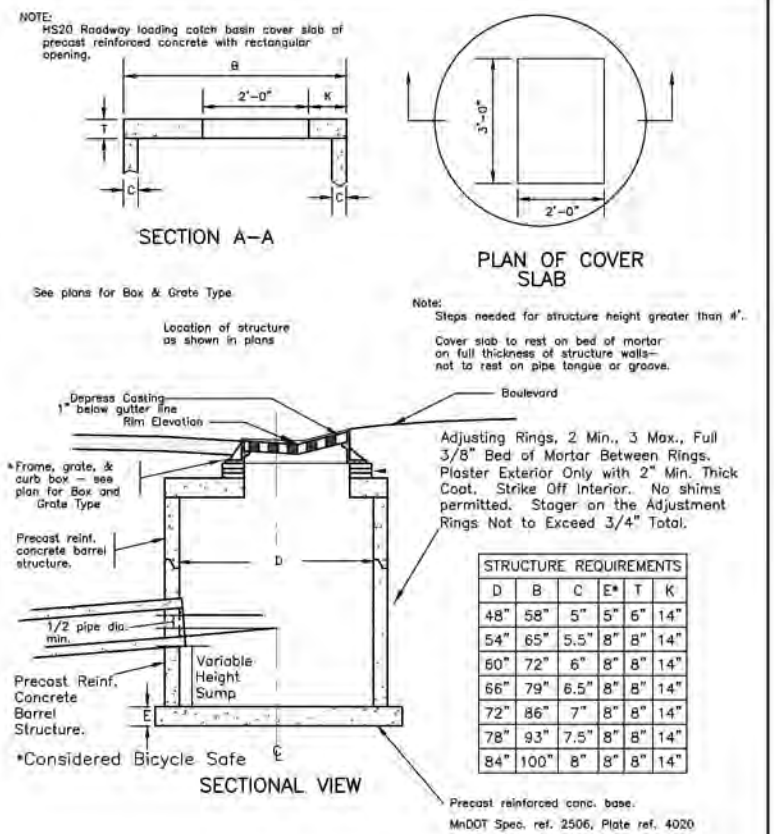


### ROUND INLET FOR ROUND MANHOLE RFC-465C1

NOT TO SCALE  
SPECIAL 1 - 48"  $\phi$

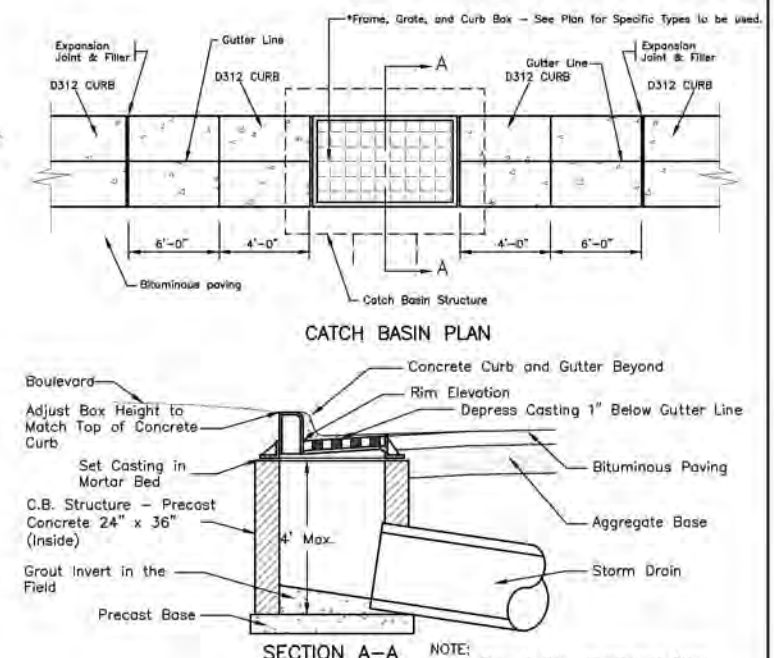
### CPP TRASH GUARD RFC-466C

NOT TO SCALE



### RECTANGULAR INLET FOR ROUND MANHOLE RFC-465B3

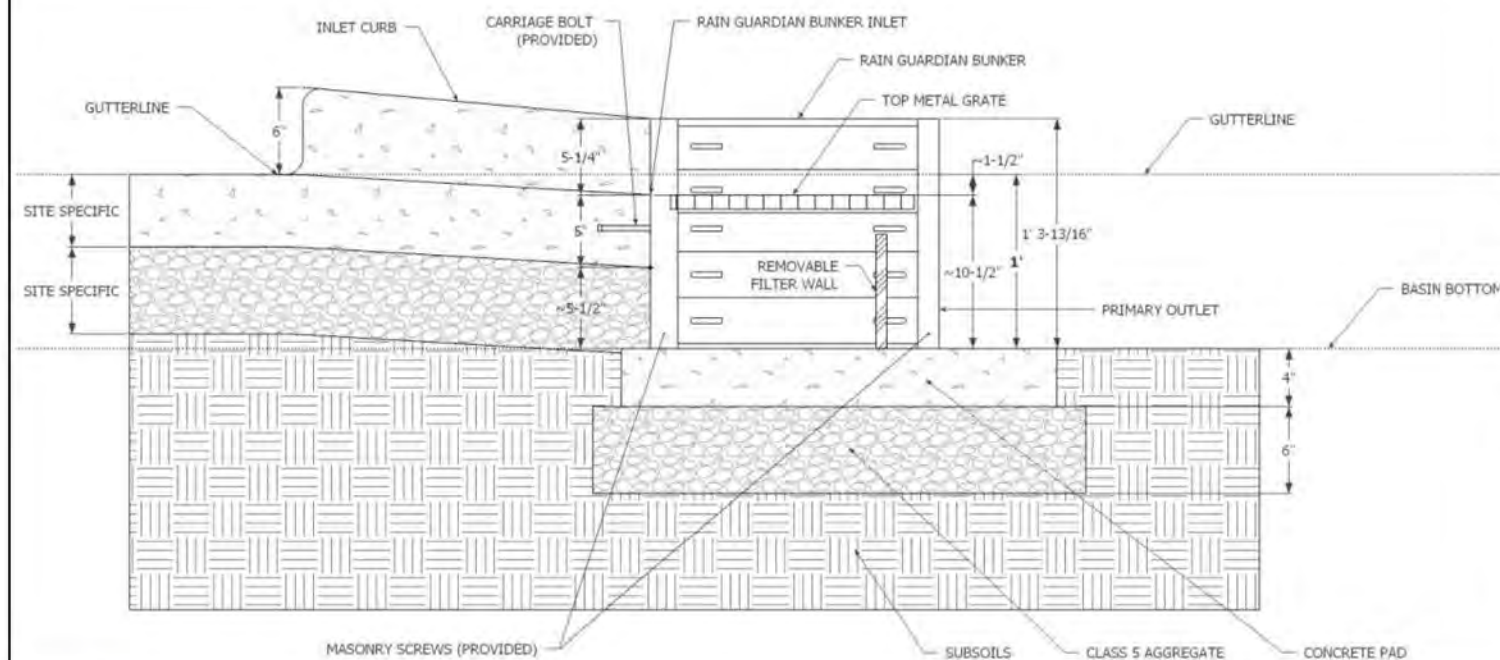
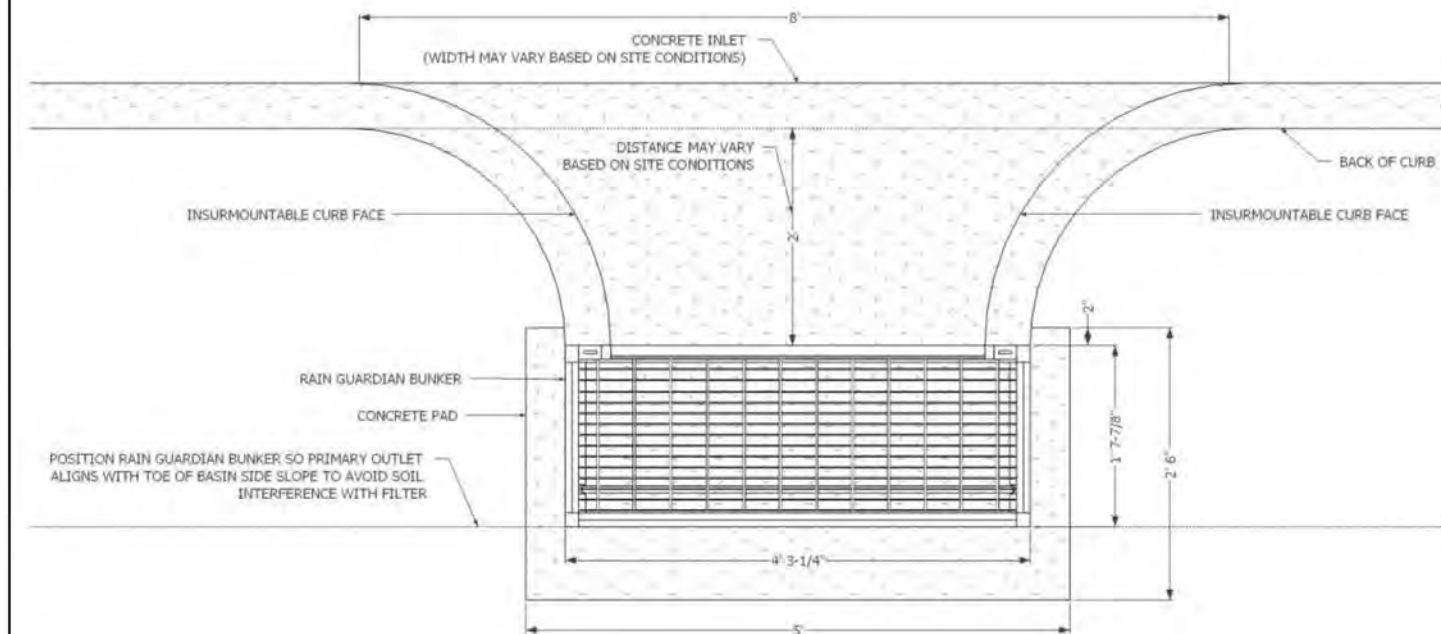
NOT TO SCALE  
SPECIAL 5 - 72"  $\phi$



### RECTANGULAR CATCH BASIN RFC-459B

NOT TO SCALE  
SPECIAL

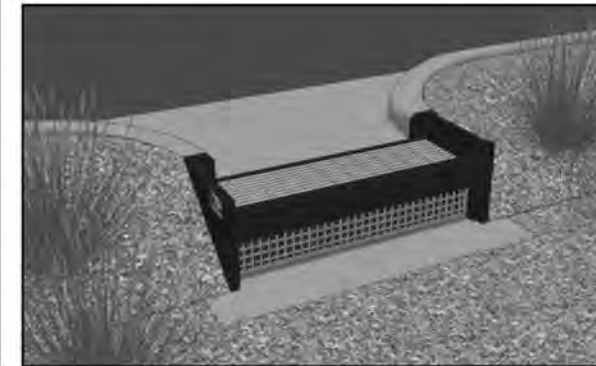




#### PLAN VIEW NOTES

1. INLET WIDTH AND DISTANCE BETWEEN BACK OF CURB AND RAIN GUARDIAN BUNKER MAY VARY WITH SITE CONDITIONS. INSTALLATION FLUSH WITH THE BACK OF THE CURB CAN ALSO BE COMPLETED WITH THE RAIN GUARDIAN BUNKER.
2. CONCRETE PAD EXTENDS BEYOND THE FILTER WALL OF THE RAIN GUARDIAN BUNKER TO SERVE AS A SPLASH DISSIPATOR.

#### INSTALLED VIEWS



#### CROSS-SECTION VIEW NOTES

1. THE TOP OF THE CLASS 5 BASE (COMPACTED TO 95% STANDARD PROCTOR) IS PRECISELY 1/4" BELOW THE GUTTERLINE ELEVATION.
2. THE TOP OF THE CONCRETE PAD IS PRECISELY 1' BELOW THE GUTTERLINE.

#### INSTALLATION NOTES

1. INSTALL THE CONCRETE PAD WITH A 1' 10" OFFSET FROM THE BACK OF THE CURB TO ACCOMMODATE THE CONCRETE INLET. THIS DISTANCE MAY VARY BASED ON SITE CONDITIONS, BUT CONSIDERATIONS SHOULD INCLUDE SLOPE OF THE INLET AND BASIN SIDE SLOPES ADJACENT TO THE RAIN GUARDIAN BUNKER. POSITION RAIN GUARDIAN BUNKER SO PRIMARY OUTLET ALIGNS WITH TOE OF BASIN SIDE SLOPE TO AVOID SOIL INTERFERENCE WITH REMOVABLE FILTER WALL. THE CONCRETE PAD SHOULD BE REINFORCED WITH REBAR.
2. EXCAVATE 1' 10" BELOW THE GUTTERLINE ELEVATION (I.E. THE BIORETENTION OVERFLOW ELEVATION) TO ACCOMMODATE THE 1' PONDING DEPTH, 6" CLASS 5 AGGREGATE, AND 4" CONCRETE PAD TO WHICH THE RAIN GUARDIAN BUNKER WILL BE SECURED. THEREFORE, THE TOP OF THE FINISHED CONCRETE PAD IS PRECISELY 1' BELOW THE GUTTERLINE ELEVATION. THE TOP OF THE RAIN GUARDIAN BUNKER METAL GRATE WILL BE 10-1/2" ABOVE THE TOP OF THE CONCRETE PAD AND 1-1/2" BELOW THE GUTTERLINE ELEVATION TO ACCOMMODATE A SLOPED INLET FROM THE GUTTER TO THE RAIN GUARDIAN BUNKER.
3. THE RAIN GUARDIAN BUNKER SHOULD BE POSITIONED 2" FROM THE EDGE OF THE CONCRETE PAD CLOSEST TO THE BACK OF THE CURB. THEREFORE, THE RAIN GUARDIAN BUNKER WILL BE 2" FROM THE BACK OF THE CURB.
4. USING THE PILOT HOLE IN EACH OF THE FOUR CORNER POSTS, PREDRILL 5/32" HOLES INTO THE CONCRETE PAD WITH A 4-1/2" MASONRY BIT AND HAMMER DRILL.
5. SECURE RAIN GUARDIAN BUNKER TO CONCRETE PAD WITH FOUR 3/16" X 2-3/4" MASONRY SCREWS (PROVIDED).
6. INSTALL FRAMING FOR INLET BETWEEN RAIN GUARDIAN BUNKER AND BACK OF CURB. TOP ELEVATIONS OF THE FRAMING SHOULD MATCH THE TOP OF THE CURB ON THE STREET SIDE AND THE TOP OF THE RAIN GUARDIAN BUNKER ON THE BIORETENTION SIDE.
7. WHEN POURING THE CONCRETE INLET, ENSURE THE CARRIAGE BOLTS ON THE RAIN GUARDIAN BUNKER ARE SURROUNDED BY AT LEAST 2" OF CONCRETE ON ALL SIDES.
8. SIDE CURBS OF THE POURED INLET MUST HAVE AN INSURMOUNTABLE PROFILE TO PREVENT WATER FLOW FROM OVERTOPPING THE DOWNSTREAM SIDE OF THE INLET.
9. WRAP CABLE THROUGH TOP METAL GRATE AND SECURE WITH PROVIDED CLAMP. ENSURE SUFFICIENT SLACK EXISTS IN CABLE TO ALLOW FOR GRATE REMOVAL AND PLACEMENT IN CONCRETE INLET DURING CLEANING. REMOVABLE FILTER WALL SHOULD BE INSTALLED WITH FILTER FABRIC FACING THE RAIN GUARDIAN BUNKER INLET.

**RAIN GUARDIAN**  
U.S. PATENT NO. 8,501,016

**PRETREATMENT FOR BIORETENTION**

Rain Gardens • Swales • Filtration Basins • Infiltration Basins

www.RainGuardian.biz

## RAIN GUARDIAN BUNKER PRETREATMENT CHAMBER BIORETENTION PONDING DEPTH: 1' TYPICAL DETAIL

| REVISION HISTORY |     |           |             |
|------------------|-----|-----------|-------------|
| REV              | BY  | DATE      | DESCRIPTION |
| A                | MDH | 12/1/15   | BUNKER—1'   |
|                  |     |           |             |
|                  |     |           |             |
|                  |     |           |             |
|                  |     |           |             |
| SCALE            |     | VARIABLE  |             |
| U.S. PATENT      |     | 8,501,016 |             |

**ANOKA CONSERVATION DISTRICT**

Anoka Conservation District  
1318 McKay Dr. NE, Suite 300  
Ham Lake, MN 55304  
763-434-2030

**Gopher State One Call**

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CENTERPOINT ENERGY (763) 323-2760  
COMCAST (952) 607-4078  
CONNEXUS ENERGY (763) 323-4268  
XCEL ENERGY (612) 526-4508

| DATE | REVISION HISTORY |
|------|------------------|
|      |                  |
|      |                  |
|      |                  |
|      |                  |
|      |                  |
|      |                  |
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|      |                  |

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*David Krueger*

DATE 5/10/2021 REG. NO. 48768

**RFC ENGINEERING, INC.**  
Consulting Engineers

13635 Johnson Street  
Ham Lake, MN 55304  
Telephone 763-862-8000  
Fax 763-862-8042

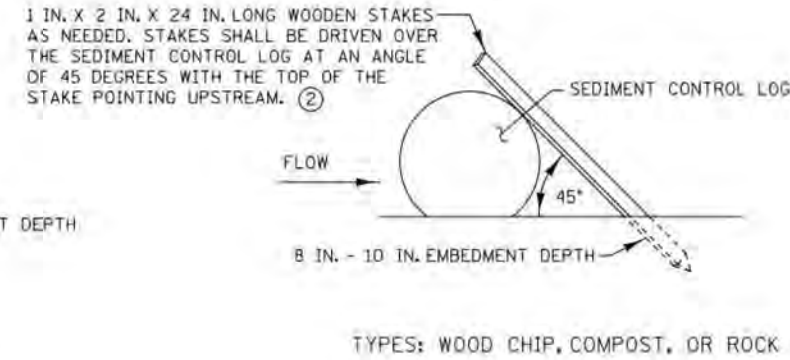
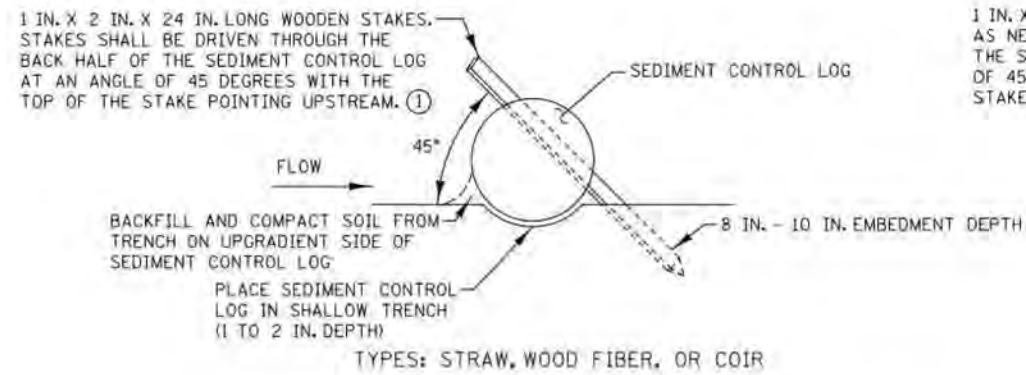
HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

RAIN GUARDIAN DETAIL

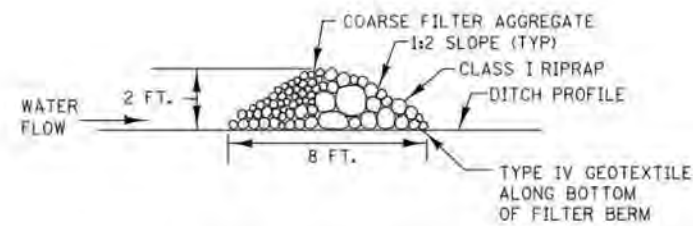
DESIGN BY: GJM DRAWN BY: GJM CHECKED BY: TPC

DWG: 1907 DETAIL 3  
DATE: 05/06/21  
JOB NUMBER: 1907  
SHEET: 7 OF 44  
FILE: 35-1-136

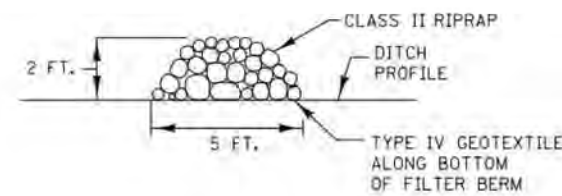




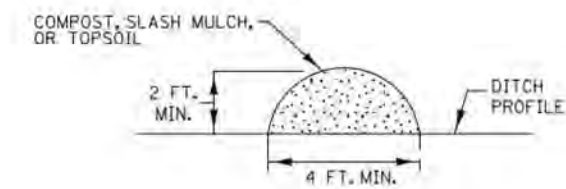
## SEDIMENT CONTROL LOGS



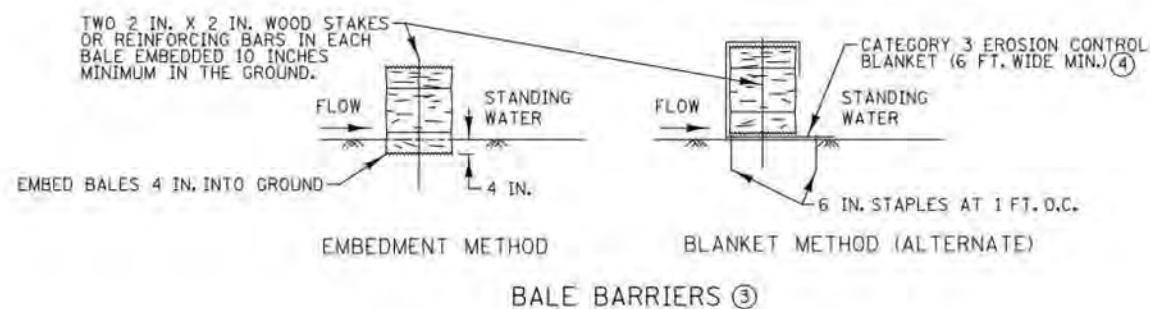
TYPE 3 (ROCK WEEPER)



TYPE 5 (ROCK)  
FILTER BERMS



TYPE 1 (COMPOST), TYPE 2 (SLASH MULCH), OR TYPE 4 (TOPSOIL)



## NOTES:

SEE SPECS. 2573, 3149, 3874, 3882, 3886, & 3897.

- ① SPACE BETWEEN STAKES SHALL BE A MAXIMUM OF 1 FOOT FOR DITCH CHECKS OR 2 FEET FOR OTHER APPLICATIONS.
- ② PLACE STAKES AS NEEDED TO PREVENT MOVEMENT OF SEDIMENT CONTROL LOGS PLACED ON SLOPES OR AS NEEDED DUE TO OTHER FACTORS. STAKES SHALL BE INCIDENTAL.
- ③ TO BE USED FOR CRITICAL PERIMETER CONTROL AREAS WHERE STANDING WATER OCCURS (6 INCH MAX. DEPTH). BALES SHALL CONSIST OF TYPE 1 MULCH OF APPROXIMATELY 14 IN. X 18 IN. X 36 IN. LONG. BALES SHALL BE PLACED ON EDGE AND BUTTED TIGHT TO ADJACENT BALES.
- ④ INSTEAD OF TRENCHING, PLACE BALE ON THE BLANKET AND WRAP BLANKET AROUND THE BALE. PLACE STAKE THROUGH BALE AND BLANKET.

REVISION:

APPROVED: 2-28-2017

*Chief Environmental Officer*  
CHIEF ENVIRONMENTAL OFFICER

S.A.P. 197-124-004

S.P. 0208-143 (TH 65)



*Tom Gilk*  
STATE DESIGN ENGINEER

REVISED:

APPROVED:

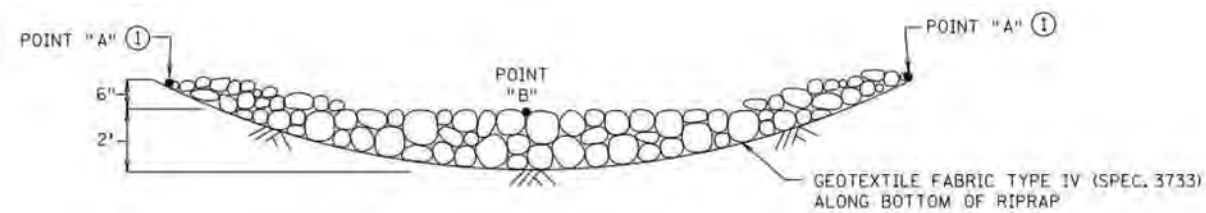
2-28-2017

TEMPORARY SEDIMENT CONTROL 2 OF 8  
FILTER BERMS, SEDIMENT CONTROL LOGS, AND BALE BARRIERS

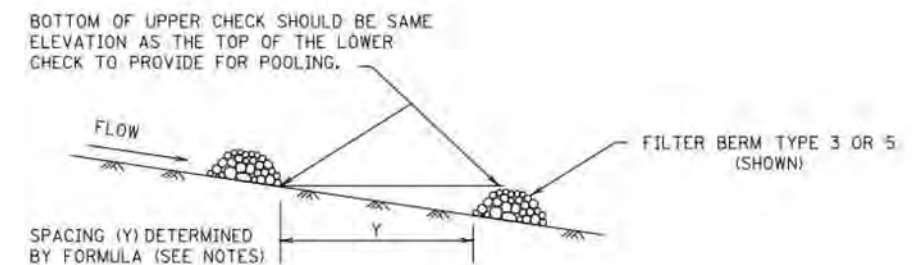
STANDARD PLAN 5-297.405

8 OF 44

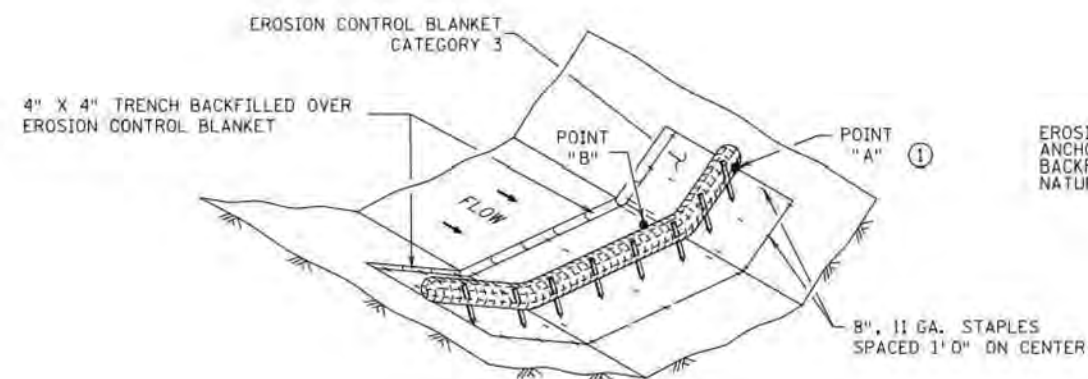




ROCK DITCH CHECKS  
FILTER BERMS TYPE 3 (ROCK WEEPER) OR FILTER TYPE 5 (ROCK) ②③  
(FOR USE ON ROUGH GRADED AREAS)



DITCH CHECK SPACING  
(FOR ALL FILTER BERM TYPES)



EROSION CONTROL BLANKET ANCHOR TRENCH, BACKFILL WITH TAMPED NATURAL SOIL.

4 IN. MIN.

FLOW

4 IN. MIN.

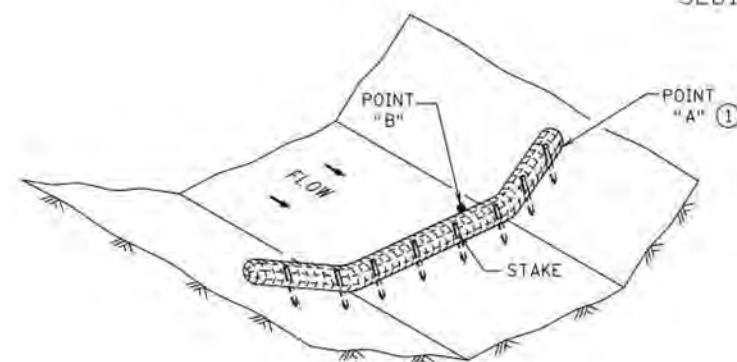
1 IN. X 2 IN. X 24 IN. LONG WOODEN STAKES AT 1 FT. MAXIMUM SPACING. STAKES SHALL BE DRIVEN THROUGH THE BACK HALF OF THE SEDIMENT CONTROL LOG AT AN ANGLE OF 45 DEGREES WITH THE TOP OF THE STAKE POINTING UPSTREAM.

SEDIMENT CONTROL LOG TYPE WOOD FIBER

EROSION CONTROL BLANKET CATEGORY 3 (8 FT. MIN. WIDTH)

STAPLE BLANKET IN ROWS WITH 6 IN. STAPLES AT 18 IN. MAX. SPACING WITHIN ROWS AND 2 FT. MAX. SPACING BETWEEN ROWS. LEADING AND TRAILING EDGE SHALL BE STAPLED APPROX. 6 IN. FROM EDGE (TYP.)

SEDIMENT CONTROL LOG TYPE BLANKET SYSTEM ④



SEDIMENT CONTROL LOG TYPE WOOD FIBER, OR TYPE COMPOST ⑤  
(FOR USE ON ROUGH GRADED AREAS)

#### NOTES:

SEE SPECS. 2573, 3601, 3733, 3885, 3886 & 3889.

FOR DITCH CHECKS, PLACE SEDIMENT CONTROL LOG PERPENDICULAR TO FLOW AND IN A CRESCENT SHAPE WITH THE ENDS FACING UPSTREAM.

APPROXIMATE SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM THE FOLLOWING SPACING FORMULA:

$$\text{APPROXIMATE SPACING OF DITCH CHECKS (FT.)} = Y = \frac{\text{DITCH CHECK HEIGHT (FT)}}{\% \text{ CHANNEL SLOPE}} \times 100$$

① POINT "A" MUST BE A MINIMUM OF 6 INCHES HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.

② PERMANENT ROCK DITCH CHECKS PLACED WITHIN THE CLEAR ZONE ARE TO BE 18" OR LESS IN HEIGHT. A 1:6 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.

③ DITCH GRADE 3% - 5%, MAX. FLOW VELOCITY 12 FT./SEC..

④ DITCH GRADE 1.5% - 3%, MAX. FLOW VELOCITY 4.5 FT./SEC..

⑤ DITCH GRADE 1.5% - 3%, MAX. FLOW VELOCITY 1.5 FT./SEC..

REVISION:

APPROVED: 2-28-2017

*Chief Environmental Officer*  
CHIEF ENVIRONMENTAL OFFICER

S.A.P. 197-124-004

S.P. 0208-143 (TH 65)



*Tom Glick*  
STATE DESIGN ENGINEER

REVISED:

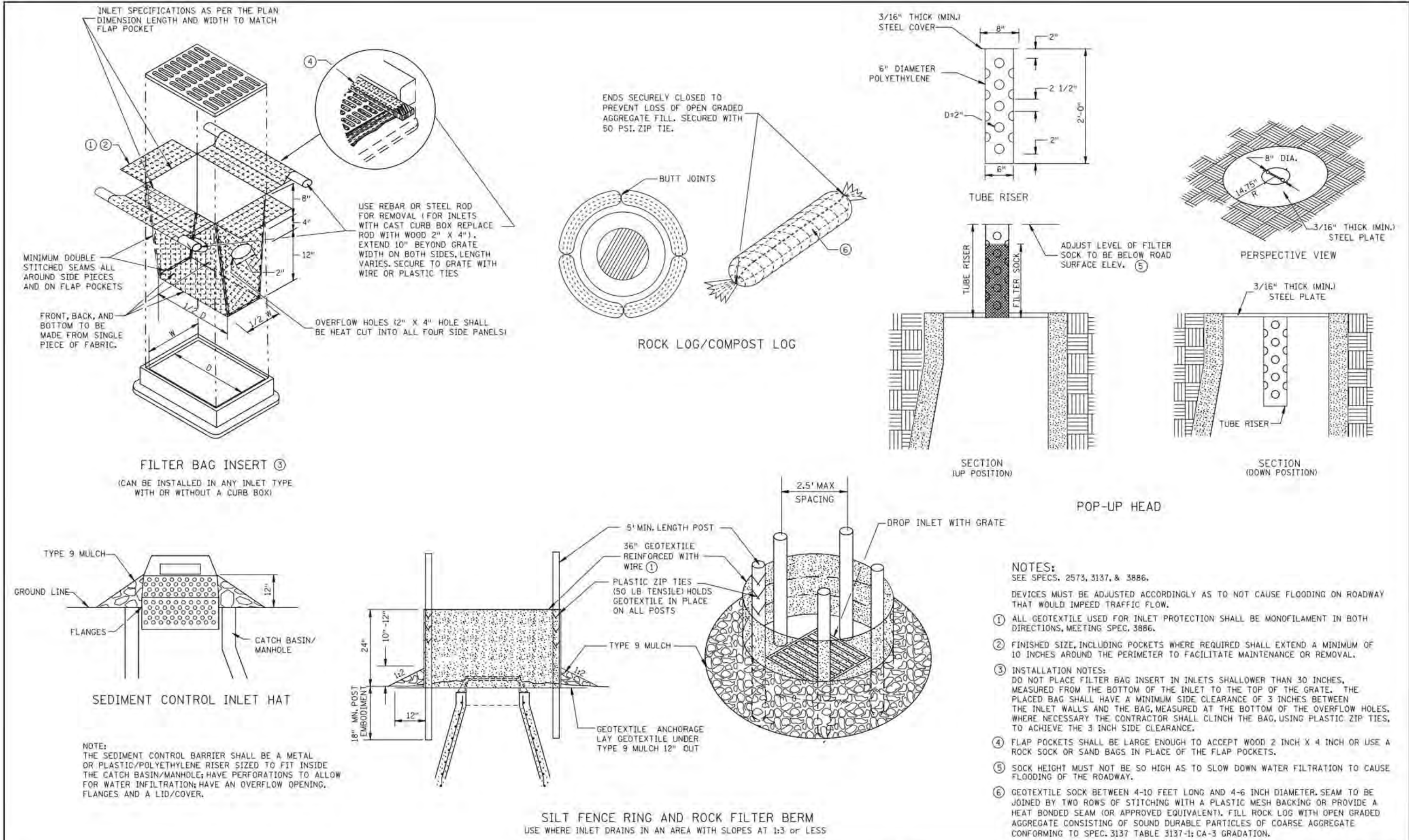
APPROVED:

2-28-2017

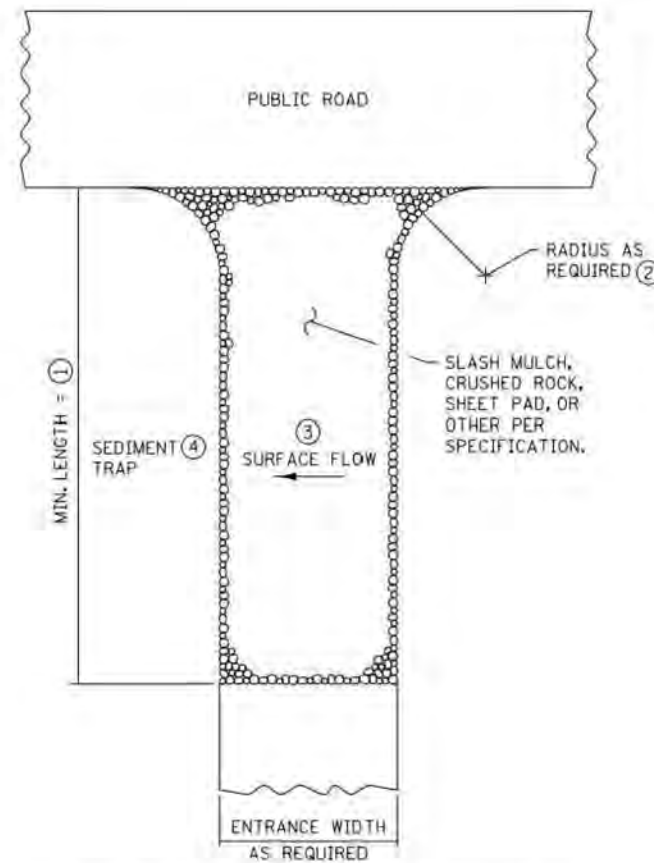
TEMPORARY SEDIMENT CONTROL 3 OF 8  
DITCH CHECK

STANDARD PLAN 5-297.405

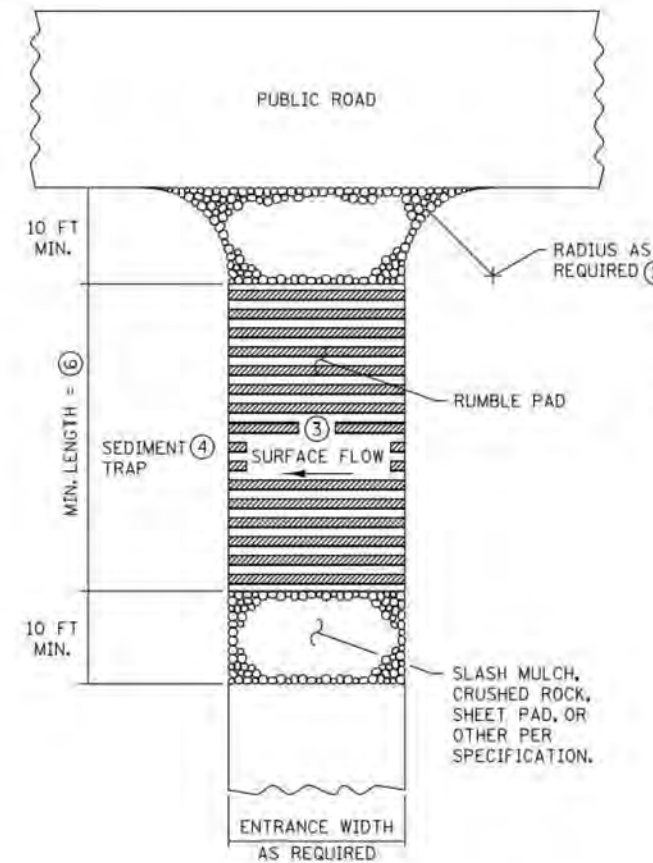
9 OF 44



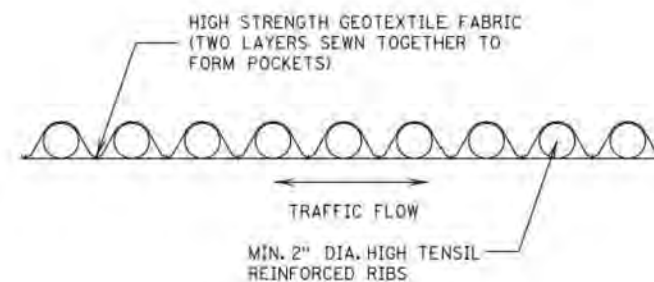
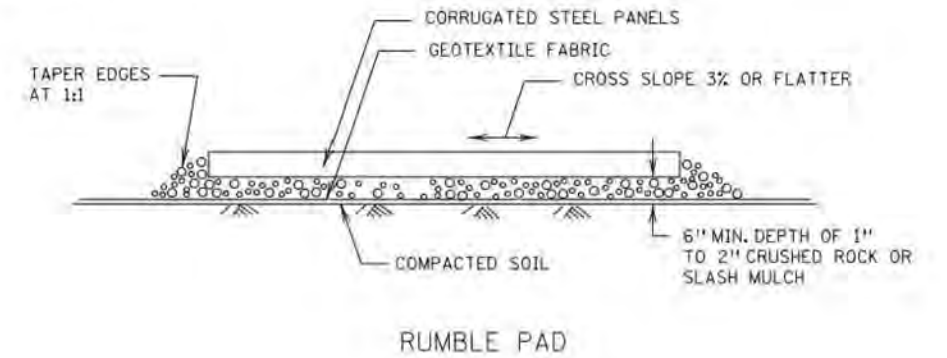




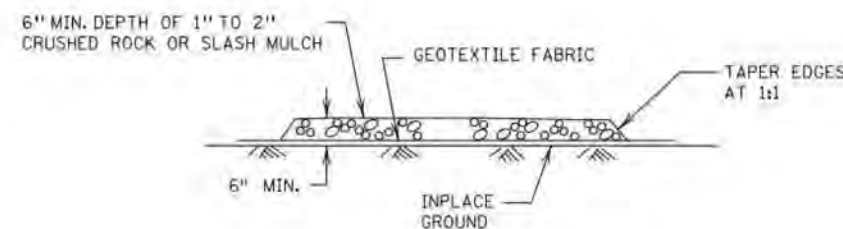
SLASH MULCH, CRUSHED ROCK, OR SHEET PAD CONSTRUCTION EXIT ⑤⑦



RUMBLE PAD CONSTRUCTION EXIT ⑤⑦



SHEET PAD



SLASH MULCH OR CRUSHED ROCK

# NOTES:

SEE SPECS. 2573 & 3882.

- ① MINIMUM LENGTH SHALL BE THE GREATER OF 50 FEET OR A LENGTH SUFFICIENT TO ALLOW A MINIMUM OF 5 TIRE ROTATIONS ON THE PROVIDED PAD. MINIMUM LENGTH SHALL BE CALCULATED USING THE LARGEST TIRE WHICH WILL BE USED IN TYPICAL OPERATIONS.
- ② PROVIDE RADIUS OR WIDEN PAD SUFFICIENTLY TO PREVENT VEHICLE TIRES FROM TRACKING OFF OF PAD WHEN LEAVING SITE.
- ③ IF RUNOFF FROM DISTURBED AREAS FLOWS TOWARD CONSTRUCTION EXITS, PREVENT RUNOFF FROM DRAINING DIRECTLY TO PUBLIC ROAD OVER CONSTRUCTION EXIT BY CROWNING THE EXIT OR SLOPING TO ONE SIDE. IF SURFACE GRADING IS INSUFFICIENT, PROVIDE OTHER MEANS OF INTERCEPTING RUNOFF.
- ④ IF RUNOFF FROM CONSTRUCTION EXITS WILL DRAIN OFF OF PROJECT SITE, PROVIDE SEDIMENT TRAP WITH STABILIZED OVERFLOW.
- ⑤ IF A TIRE WASH OFF IS REQUIRED THE CONSTRUCTION EXITS SHALL BE GRADED TO DRAIN THE WASH WATER TO A SEDIMENT TRAP.
- ⑥ MINIMUM LENGTH OF RUMBLE PAD SHALL BE 20 FEET, OR AS REQUIRED TO REMOVE SEDIMENT FROM TIRES. IF SIGNIFICANT SEDIMENT IS TRACKED FROM THE SITE, THE RUMBLE PAD SHALL BE LENGTHENED OR THE DESIGN MODIFIED TO PROVIDE ADDITIONAL VIBRATION. WASH-OFF LENGTH SHALL BE AS REQUIRED TO EFFECTIVELY REMOVE CONSTRUCTION SEDIMENT FROM VEHICLE TIRES.
- ⑦ MAINTENANCE OF CONSTRUCTION EXITS SHALL OCCUR WHEN THE EFFECTIVENESS OF SEDIMENT REMOVAL HAS BEEN REDUCED. MAINTENANCE SHALL CONSIST OF REMOVING SEDIMENT AND CLEANING THE MATERIALS OR PLACING ADDITIONAL MATERIAL (SLASH MULCH OR CRUSHED ROCK) OVER SEDIMENT FILLED MATERIAL TO RESTORE EFFECTIVENESS.

REVISION:  
APPROVED: 2-28-2017  
CHIEF ENVIRONMENTAL OFFICER

S.A.P. 197-124-004

S.P. 0208-143 (TH 65)

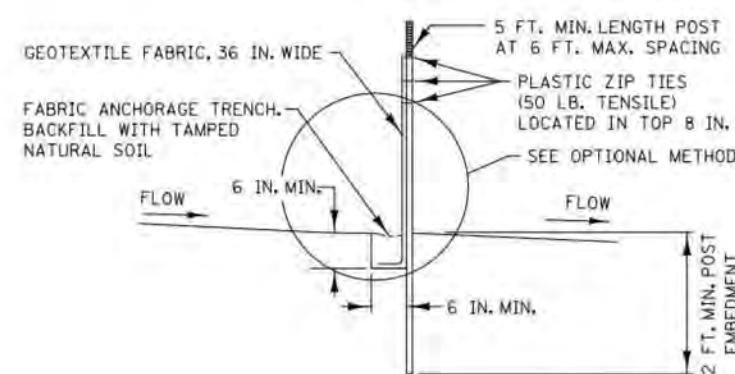
MINNESOTA  
DEPARTMENT  
OF  
TRANSPORTATION

REVISOR:  
APPROVED: 2-28-2017  
STATE DESIGN ENGINEER

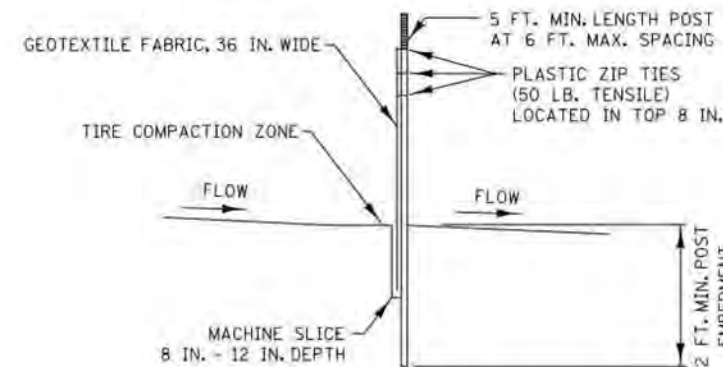
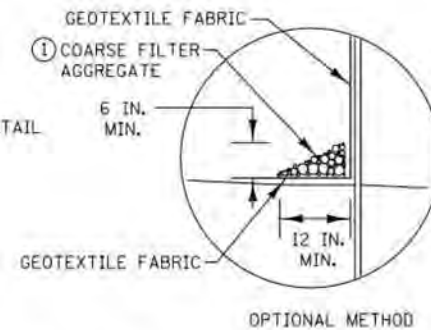
TEMPORARY SEDIMENT CONTROL 5 OF 8  
STABILIZED CONSTRUCTION EXIT

STANDARD PLAN 5-297.405

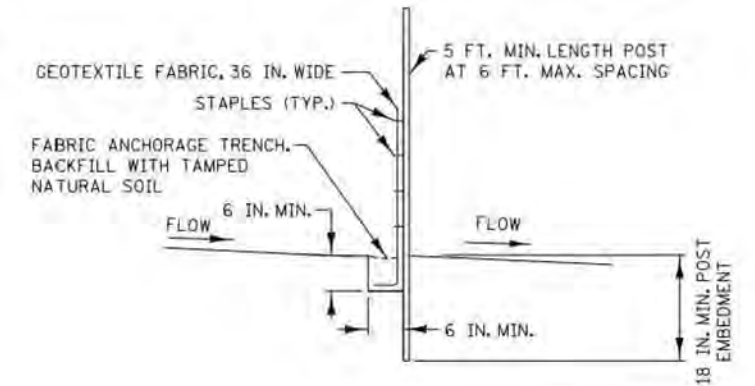
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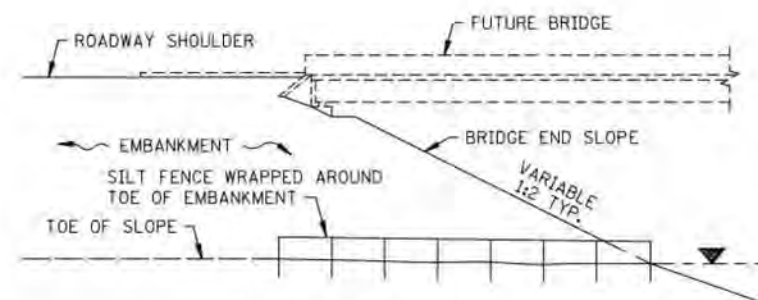
SILT FENCE TYPE HI ②  
(HAND INSTALLED)



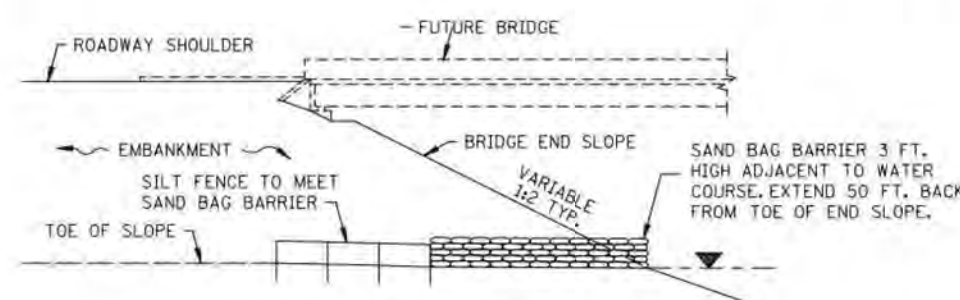
SILT FENCE TYPE MS ②  
(MACHINE SLICED)



SILT FENCE TYPE PA ③  
(PREASSEMBLED)

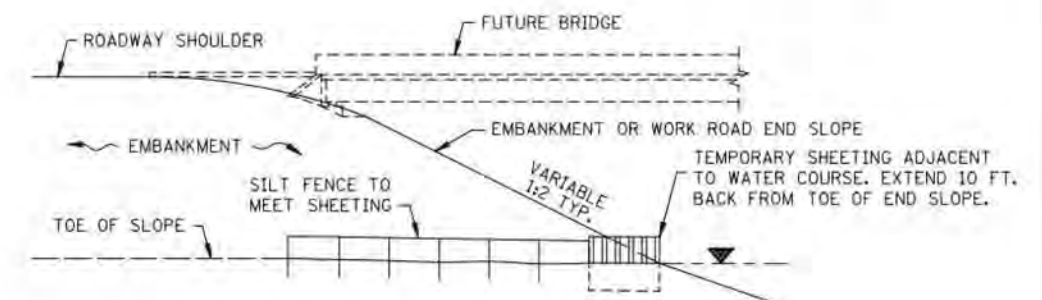


SILT FENCE ONLY ④

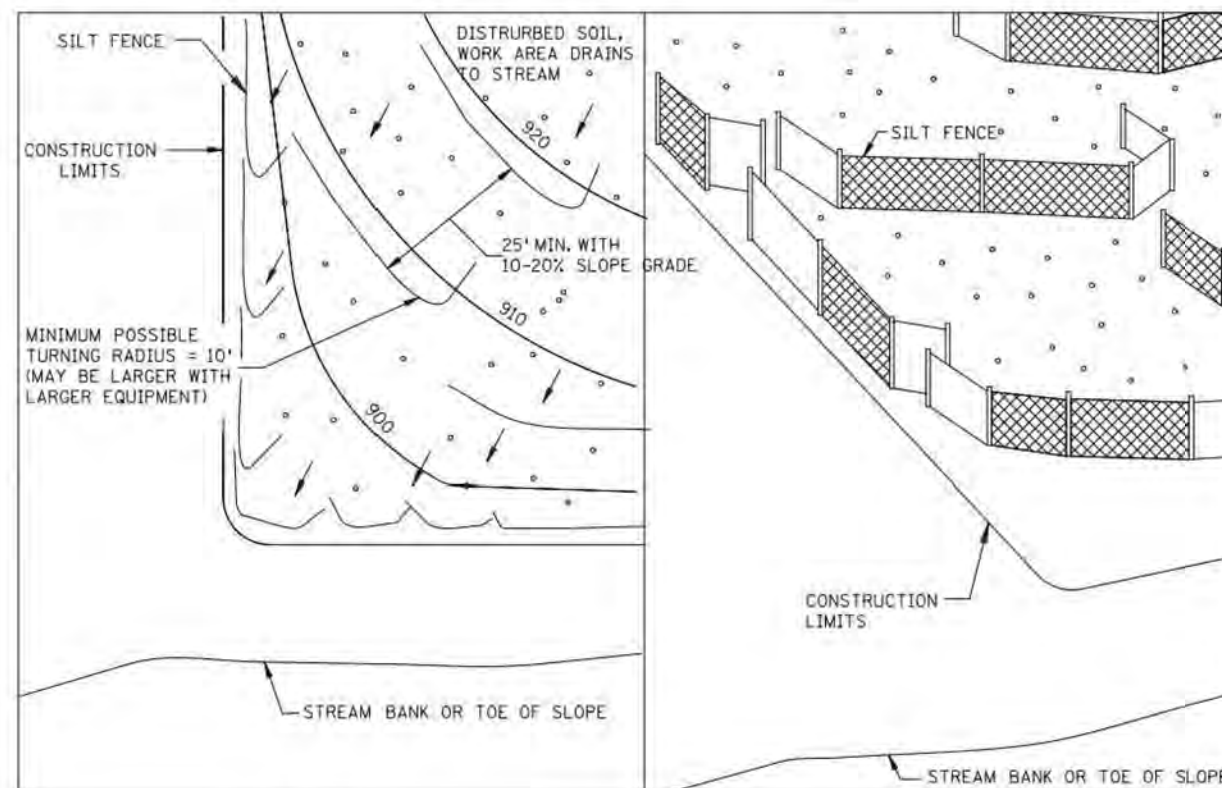


SILT FENCE WITH SAND BAGS ⑤

INSTALLATION AT BRIDGE EMBANKMENT ADJACENT TO WATER



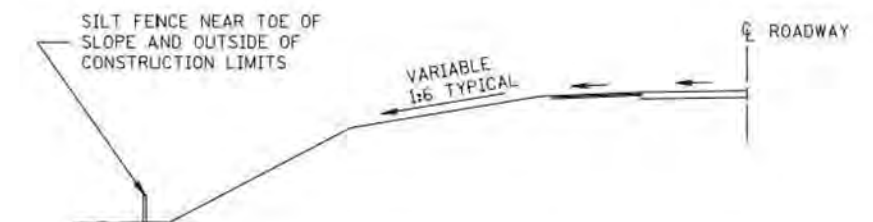
SILT FENCE WITH SHEETING ⑥



PLAN VIEW

PERSPECTIVE VIEW

J-HOOK INSTALLATION



LOCATION AT TOE OF ROADWAY EMBANKMENT

NOTES:

- ① SEE SPECS, 2573, 3149 & 3886.
- ② COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.
- ③ TO PROTECT AREAS FROM SHEET FLOW, MAXIMUM CONTRIBUTING AREA: 1 ACRE.
- ④ TO PROTECT AREAS FROM SHEET FLOW, MAXIMUM CONTRIBUTING AREA: 0.25 ACRE.
- ⑤ WATER COURSE FLOW VELOCITY: STANDING. CONTRIBUTING SLOPE AREA: 1/2 ACRE.
- ⑥ WATER COURSE FLOW VELOCITY: 1 TO 7 FT./SEC. CONTRIBUTING SLOPE AREA: 1 ACRE.
- ⑦ WATER COURSE FLOW VELOCITY: 8 TO 15 FT./SEC. CONTRIBUTING SLOPE AREA: 3 ACRES.

REVISION:  
APPROVED: 2-28-2017  
Chief Environmental Officer

S.A.P. 197-124-004

S.P. 0208-143 (TH 65)

MINNESOTA  
DEPARTMENT  
OF  
TRANSPORTATION

STATE DESIGN ENGINEER

REVISED:

APPROVED:

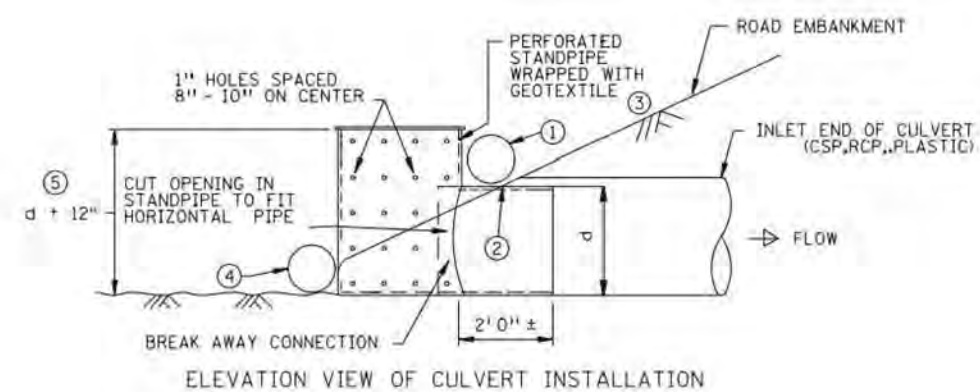
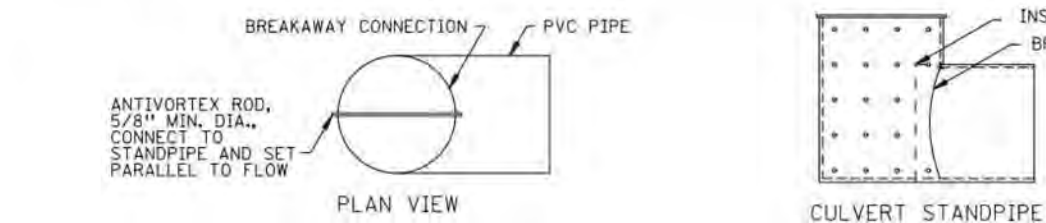
2-28-2017

TEMPORARY SEDIMENT CONTROL 6 OF 8  
SILT FENCE

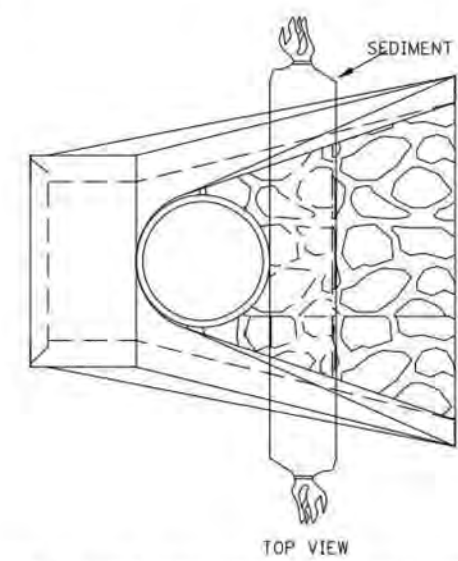
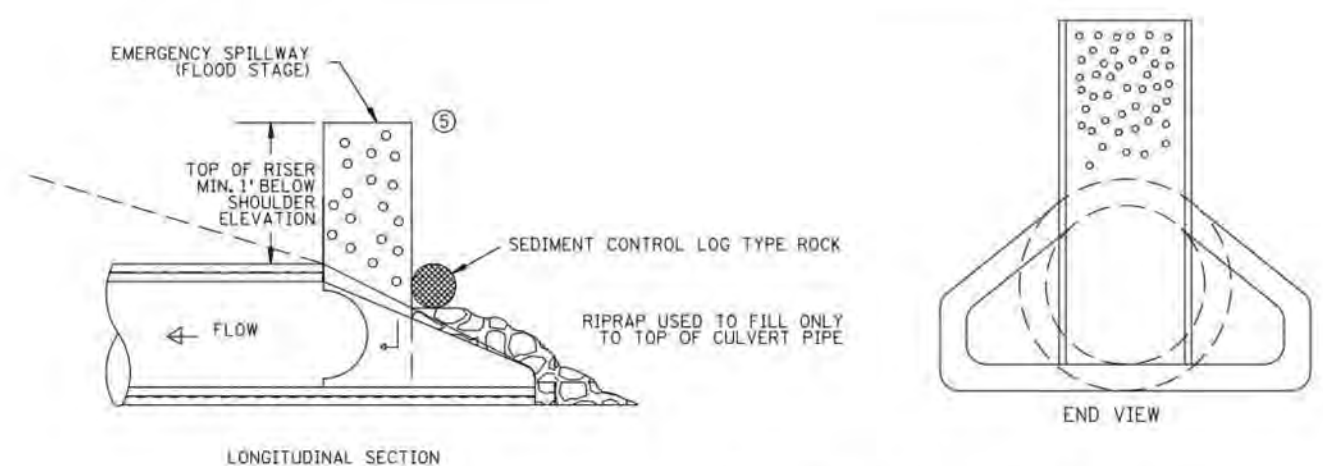
STANDARD PLAN 5-297.405

12 OF 44

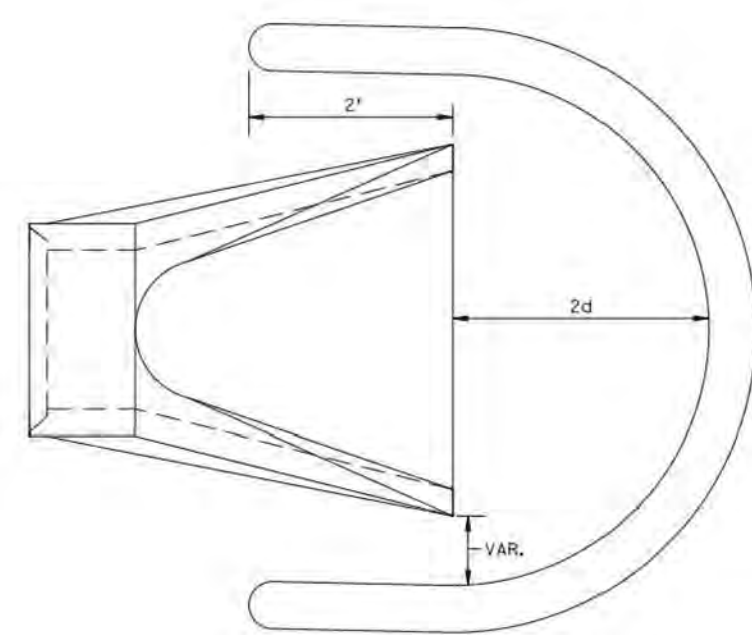




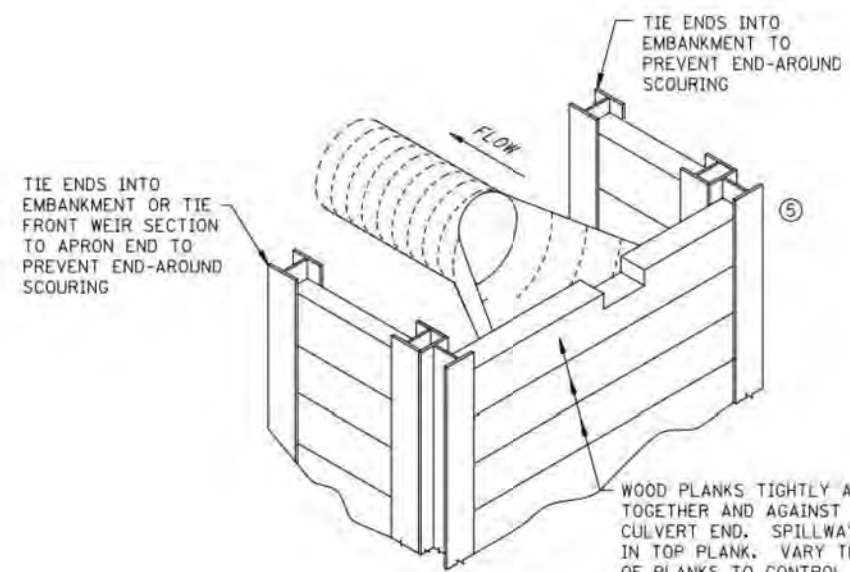
CULVERT STANDPIPE INSERT (D-RISER)  
d = CULVERT SIZE: 12" - 36"



CULVERT STANDPIPE INSERT (D-RISER)



SEDIMENT CONTROL LOG WEIR  
(COMPOST, WOOD CHIP, OR ROCK)  
d = CULVERT SIZE: 12" - 36"



WOOD PLANK WEIR

- NOTES:
- SEE SPECS. 2573, 3891 & 3893.
  - FOR USE WHEN TEMPORARY PONDING IS NEEDED IN DITCH SECTIONS FOR SEDIMENT CONTROL.
  - MANUFACTURED ALTERNATIVES LISTED ON MnDOT'S APPROVED PRODUCTS LIST MAY BE SUBSTITUTED AT NO ADDITIONAL COST.
  - ① ROCK LOG OR SANDBAG TO HOLD STANDPIPE AND ACT AS A SEAL BETWEEN RISER PIPE AND CULVERT.
  - ② PLACE CULVERT APRON AND SLIDE TEMPORARY STANDPIPE INTO CSP OR RCP CULVERT.
  - ③ ALL GEOTEXTILE USED FOR CULVERT PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3886 FOR MACHINE SLICED.
  - ④ ROCK LOG OR RIP RAP TO HOLD STANDPIPE AND ACT AS A FILTER BETWEEN RISER PIPE AND CULVERT.
  - ⑤ HEIGHT OVERFLOW NOT TO CAUSE FLOODING OF ROAD OR ADJACENT PROPERTIES.

REVISION:

APPROVED: 2-28-2017

*Sup. Elvel*

CHIEF ENVIRONMENTAL OFFICER

S.A.P. 197-124-004

S.P. 0208-143 (TH 65)

**m**  
MINNESOTA  
DEPARTMENT  
OF  
TRANSPORTATION

*Tom Gil*

STATE DESIGN ENGINEER

REVISED:

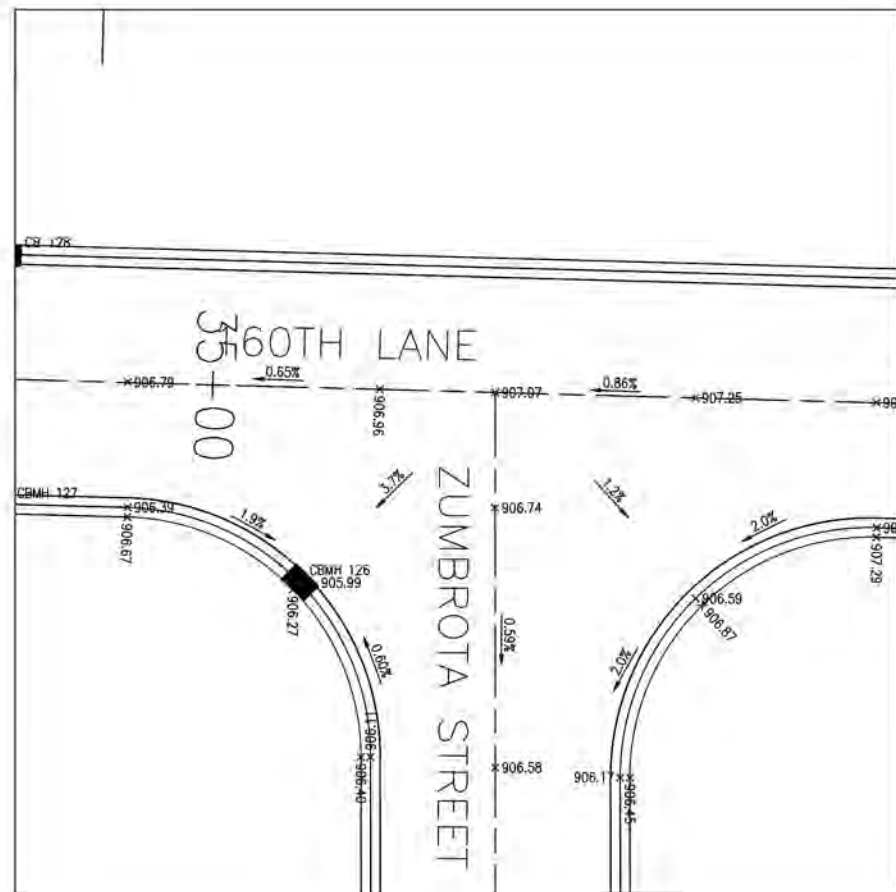
APPROVED:

2-28-2017

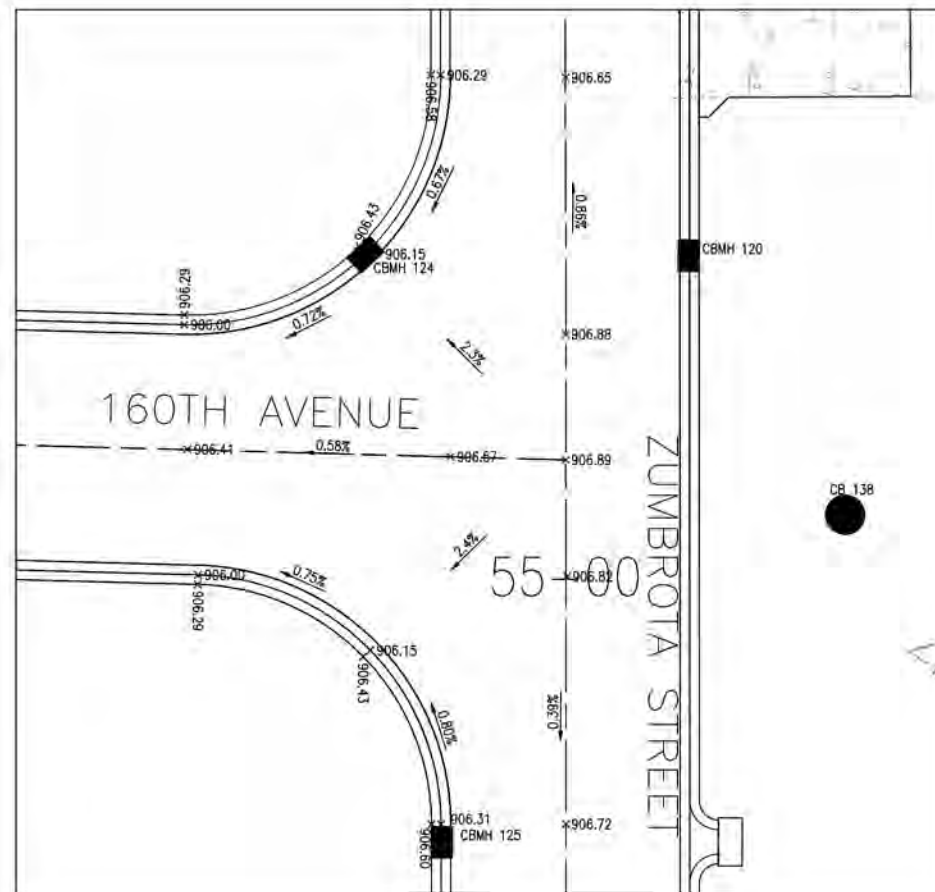
TEMPORARY SEDIMENT CONTROL 8 OF 8  
CULVERT END CONTROLS

STANDARD PLAN 5-297.405

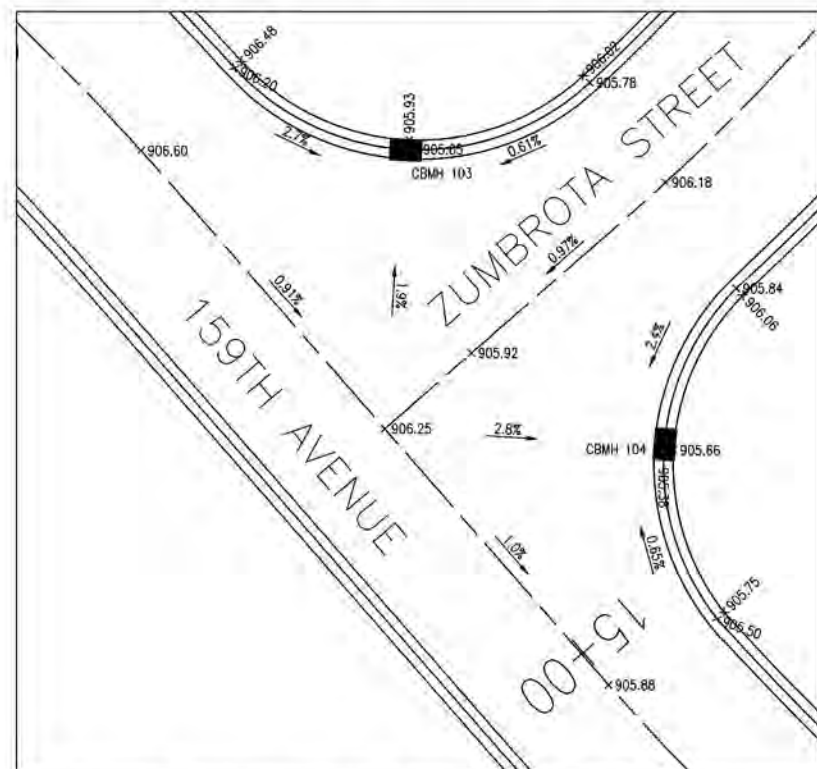
13 OF 44



160TH LANE AND ZUMBROTA STREET



160TH AVENUE AND ZUMBROTA STREET

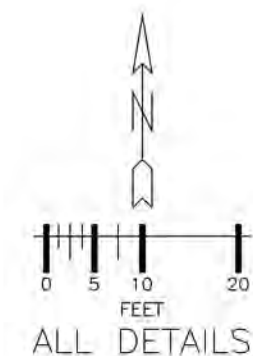


159TH AVENUE AND ZUMBROTA STREET

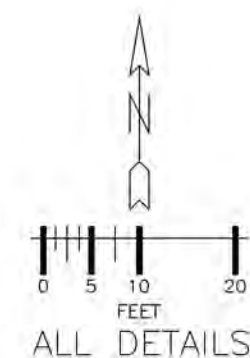
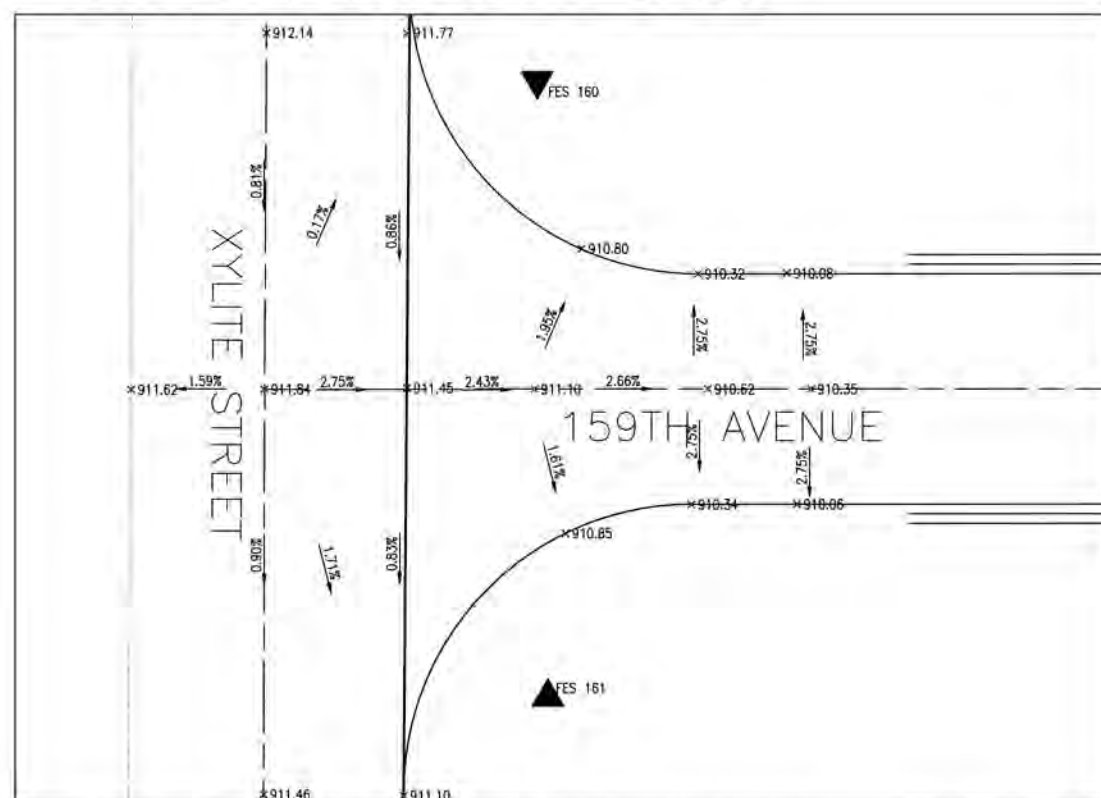
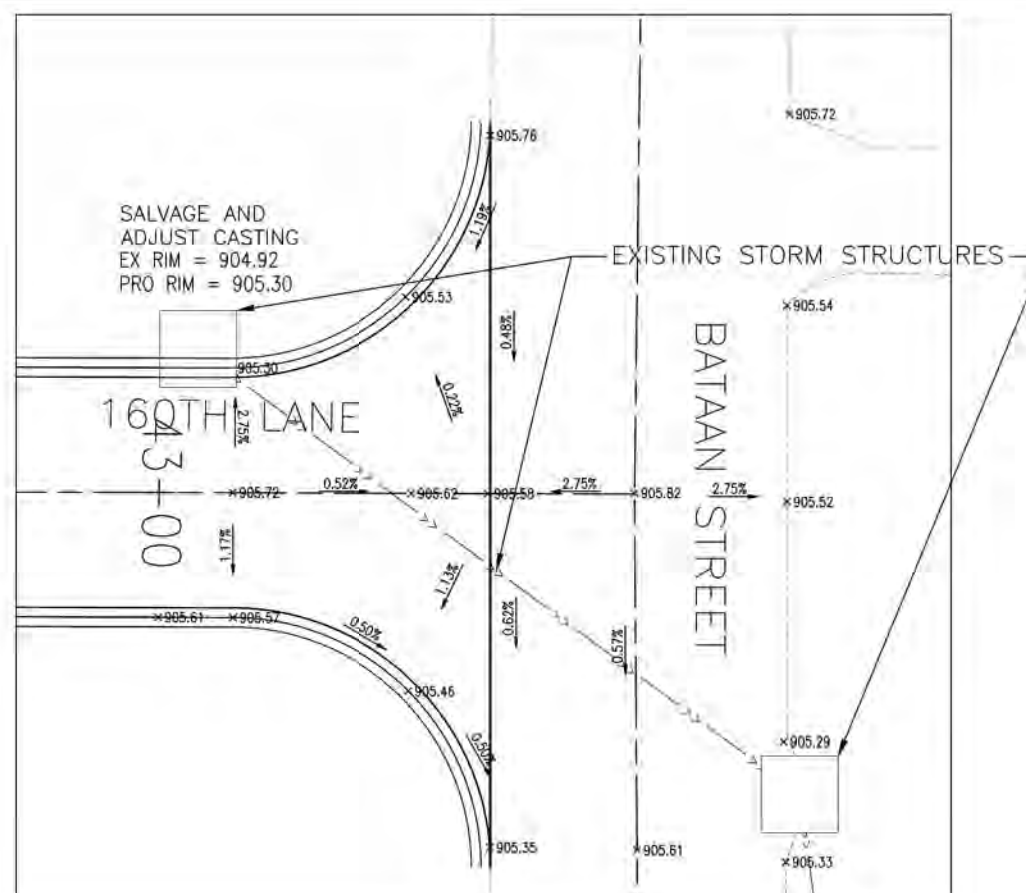
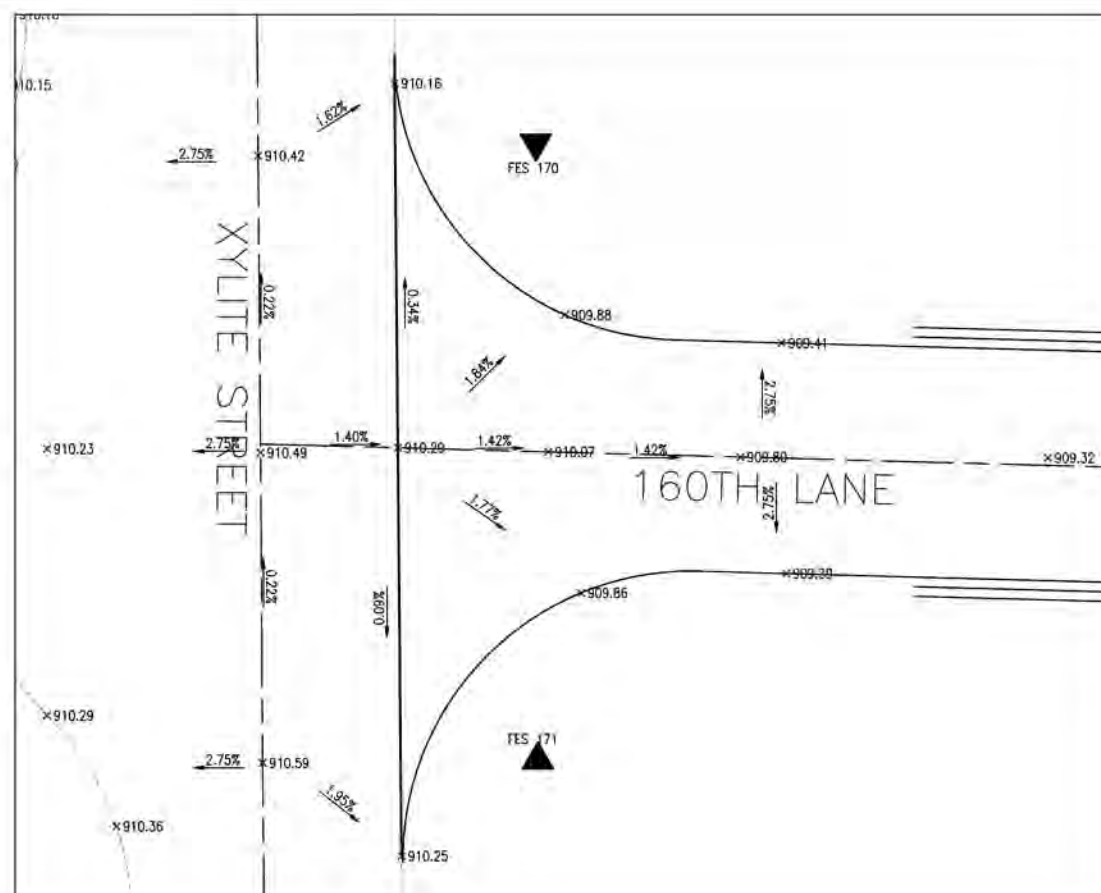


159TH AVENUE AND ALAMO STREET

| INTERSECTION STATIONS |                    |                       |                          |
|-----------------------|--------------------|-----------------------|--------------------------|
| CROSS ROAD NAME       | CROSS ROAD STATION | TERMINATING ROAD NAME | TERMINATING ROAD STATION |
| 160TH LANE            | 35+29.13           | ZUMBROTA STREET       | 58+67.22                 |
| ZUMBROTA STREET       | 55+12.14           | 160TH AVENUE          | 72+98.04                 |
| 159TH AVENUE          | 14+88.58           | ZUMBROTA STREET       | 50+00.00                 |
| 159TH AVENUE          | 19+90.10           | ALAMO STREET          | 60+00.00                 |







**800-252-1166 651-454-0002**

|            |                    |       |          |
|------------|--------------------|-------|----------|
| UTILITIES: | CENTURYLINK        | (763) | 712-5017 |
|            | CENTERPOINT ENERGY | (763) | 323-2760 |
|            | COMCAST            | (952) | 807-4078 |
|            | CONNEXUS ENERGY    | (763) | 323-4268 |
|            | XCEL ENERGY        | (612) | 526-4508 |

|      |                  |                                                                                                                                                                                                                         |
|------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DATE | REVISION HISTORY | I HEREBY CERTIFY THAT THIS PLAN WAS<br>PREPARED BY ME OR UNDER MY<br>DIRECT SUPERVISION AND THAT I AM A<br>DULY REGISTERED PROFESSIONAL<br>ENGINEER UNDER THE LAWS OF THE<br>STATE OF MINNESOTA.<br><i>Dore Krueger</i> |
|      |                  | DATE 5/10/2021 REG. NO. 48768                                                                                                                                                                                           |

**RFC ENGINEERING, INC.**  
**Consulting Engineers**

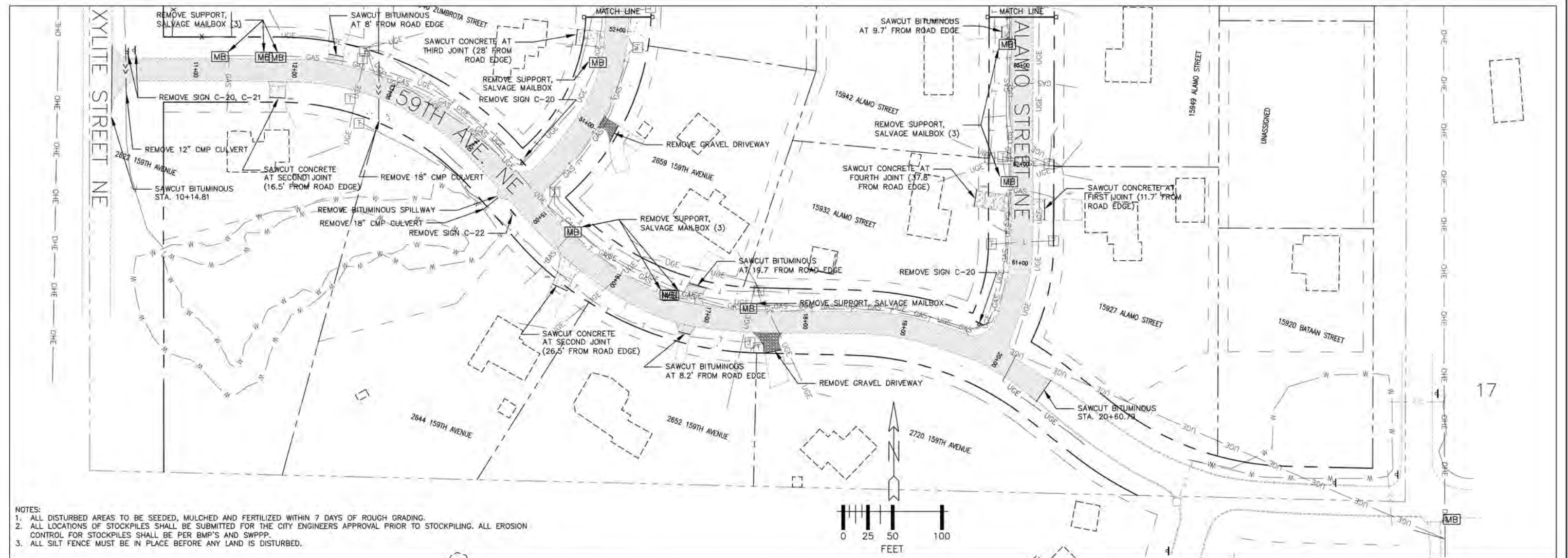
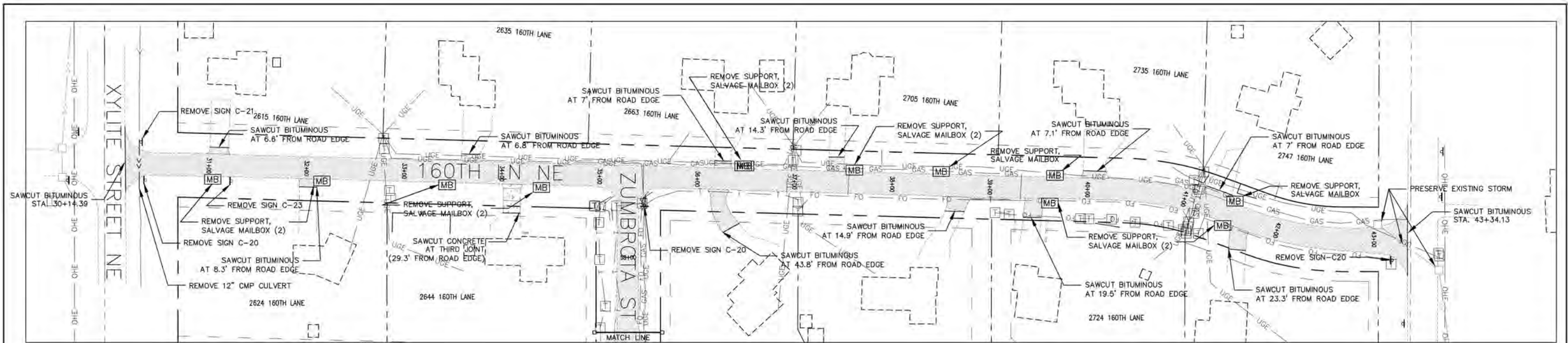
13635 Johnson Street  
Ham Lake, MN 55304  
Telephone 763-862-8000  
Fax 763-862-8042

HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

INTERSECTION DETAILS

DESIGN BY: GJM      DRAWN BY: GJM      CHECKED BY: TPC

|             |            |
|-------------|------------|
| DWG:        | 1907 INT 2 |
| DATE:       | 05/06/21   |
| JOB NUMBER: | 1907       |
| SHEET:      | 15 OF 44   |
| FILE:       | 35-1-144   |



- NOTES:
1. ALL DISTURBED AREAS TO BE SEEDED, MULCHED AND FERTILIZED WITHIN 7 DAYS OF ROUGH GRADING.
  2. ALL LOCATIONS OF STOCKPILES SHALL BE SUBMITTED FOR THE CITY ENGINEERS APPROVAL PRIOR TO STOCKPILING. ALL EROSION CONTROL FOR STOCKPILES SHALL BE PER BMP'S AND SWPPP.
  3. ALL SILT FENCE MUST BE IN PLACE BEFORE ANY LAND IS DISTURBED.



UTILITIES: CENTURYLINK (763) 712-5017  
 CENTERPOINT ENERGY (763) 323-2760  
 COMCAST (952) 607-4078  
 CONNEXUS ENERGY (763) 323-4268  
 XCEL ENERGY (612) 526-4508

| DATE | REVISION HISTORY |
|------|------------------|
|      |                  |
|      |                  |
|      |                  |

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Dave Krueger*

DATE 5/10/2021 REG. NO. 48768

**RFC ENGINEERING, INC.**  
**Consulting Engineers**

13635 Johnson Street  
 Ham Lake, MN 55304  
 Telephone 763-862-8000  
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HAM LAKE IMPROVEMENT PROJECT 1907  
 LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
 159TH AVE NE, 160TH LN NE, AND OTHERS

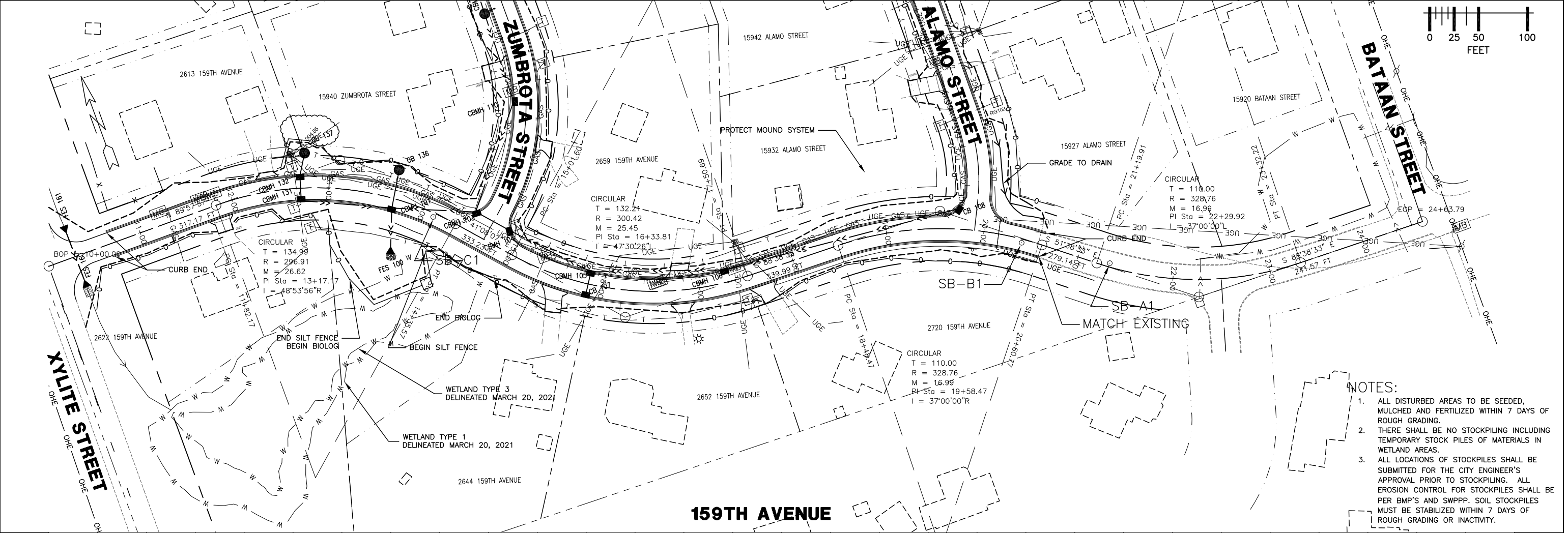
159TH LANE AND 160TH LANE  
 REMOVALS

DESIGN BY: GJM DRAWN BY: GJM CHECKED BY: TPC

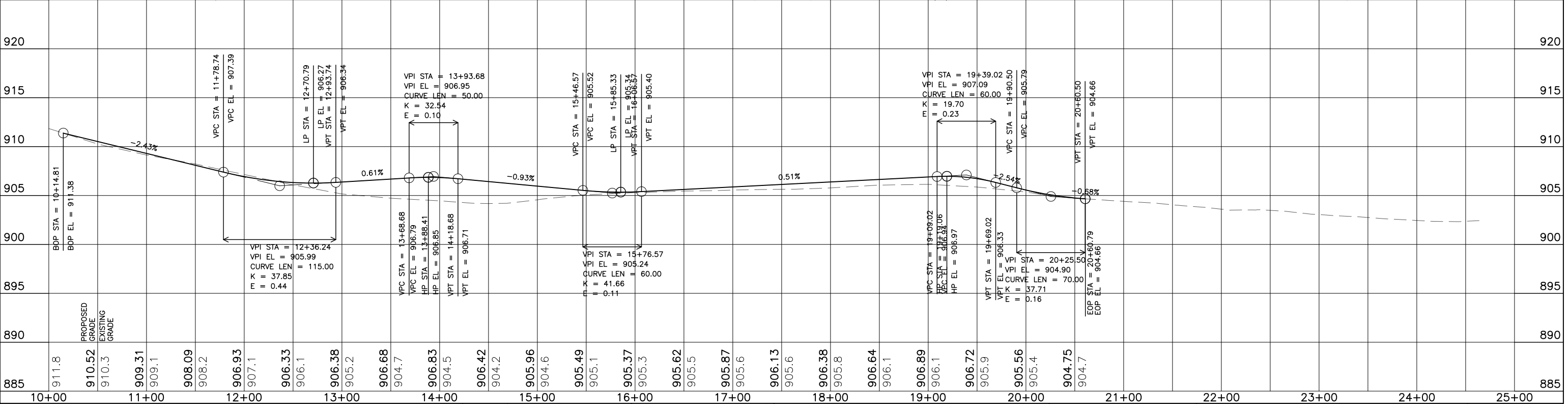
DWG: 1907 REMOVAL 1  
 DATE: 05/06/21  
 JOB NUMBER: 1907  
 SHEET: 16 OF 44  
 FILE: 35-1-145







- NOTES:
1. ALL DISTURBED AREAS TO BE SEEDED, MULCHED AND FERTILIZED WITHIN 7 DAYS OF ROUGH GRADING.
  2. THERE SHALL BE NO STOCKPILING INCLUDING TEMPORARY STOCK PILES OF MATERIALS IN WETLAND AREAS.
  3. ALL LOCATIONS OF STOCKPILES SHALL BE SUBMITTED FOR THE CITY ENGINEER'S APPROVAL PRIOR TO STOCKPILING. ALL EROSION CONTROL FOR STOCKPILES SHALL BE PER BMP'S AND SWPPP. SOIL STOCKPILES MUST BE STABILIZED WITHIN 7 DAYS OF ROUGH GRADING OR INACTIVITY.



800-252-1166 651-454-0002

UTILITIES:

|                    |                |
|--------------------|----------------|
| CENTURYLINK        | (763) 712-5017 |
| CENTERPOINT ENERGY | (763) 323-2760 |
| COMCAST            | (952) 607-4078 |
| CONNEXUS ENERGY    | (763) 323-4268 |
| XCEL ENERGY        | (612) 526-4508 |

| DATE     | REVISION HISTORY |
|----------|------------------|
| 7/6/2021 | GRADING          |

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE 6/3/2021 REG. NO. 48768

**RFC ENGINEERING, INC.**  
Consulting Engineers

13635 Johnson Street  
Ham Lake, MN 55304  
Telephone 763-862-8000  
Fax 763-862-8042

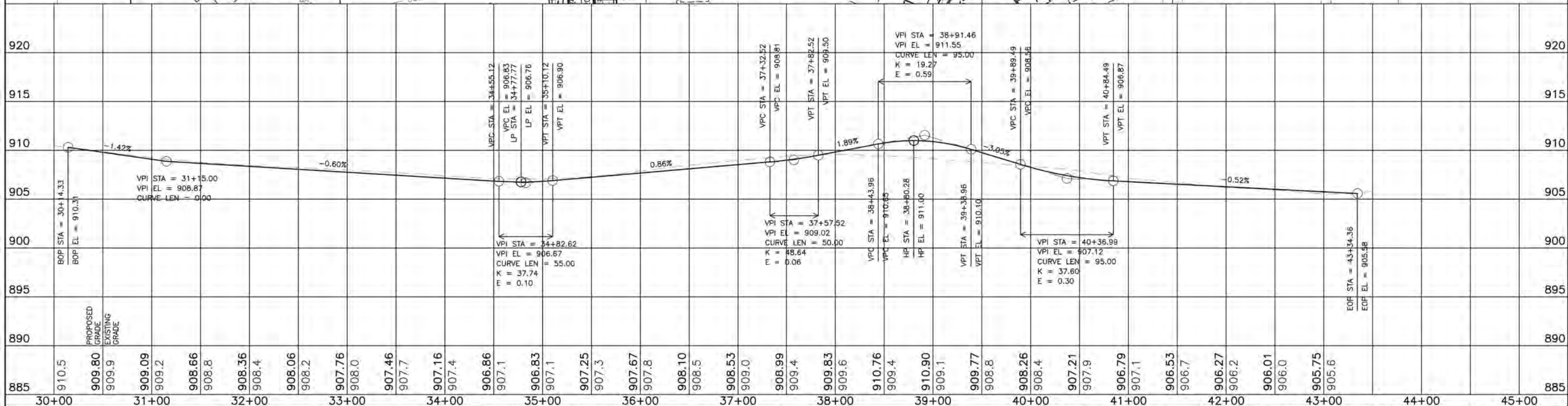
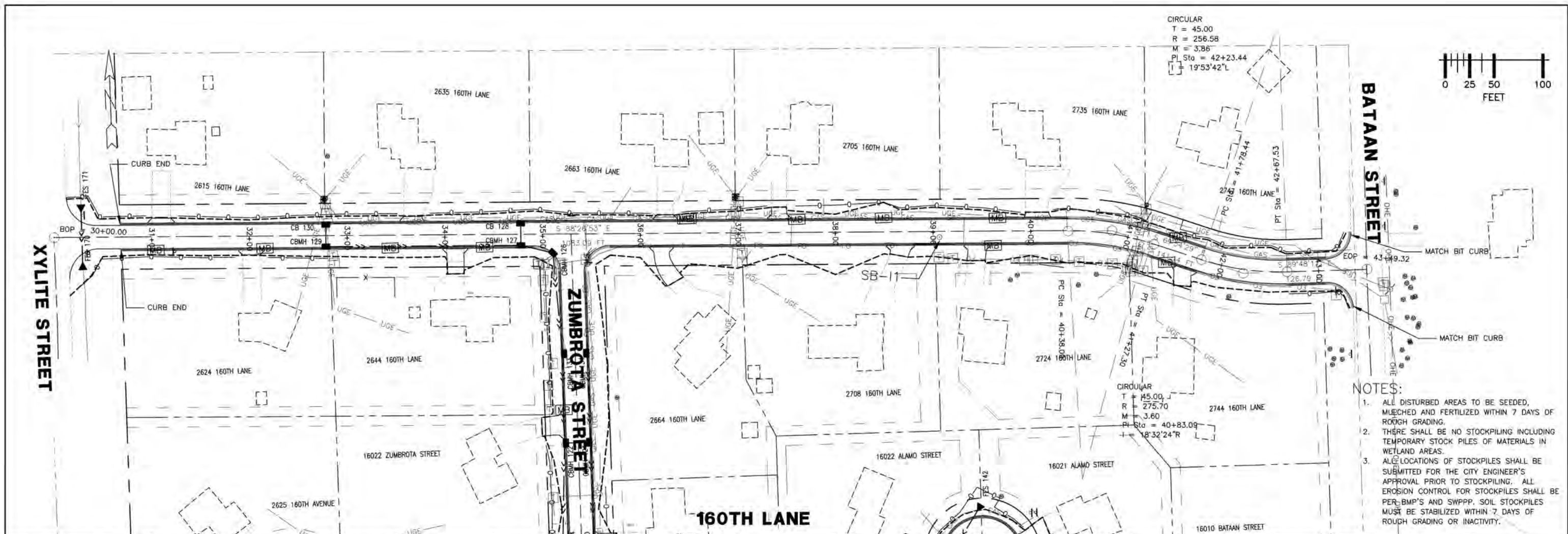
HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

PLAN AND PROFILE

DESIGN BY: GJM DRAWN BY: GJM CHECKED BY: TPC

|             |          |
|-------------|----------|
| DWG:        | RCP01001 |
| DATE:       | 05/06/21 |
| JOB NUMBER: | 1907     |
| SHEET:      | 18 OF 44 |
| FILE:       | 35-1-XX  |





**Gopher State One Call**  
 800-252-1166 651-454-0002  
PLOT DATE: 5/11/2021 13:14

**UTILITIES:**

|                    |                |
|--------------------|----------------|
| CENTURYLINK        | (763) 712-5017 |
| CENTERPOINT ENERGY | (763) 323-2760 |
| COMCAST            | (952) 607-4078 |
| CONNEXUS ENERGY    | (763) 323-4268 |
| XCEL ENERGY        | (612) 526-4508 |

**DATE**      **REVISION HISTORY**

| DATE | REVISION HISTORY |
|------|------------------|
|      |                  |
|      |                  |
|      |                  |

HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Dave Krueger*  
DATE 5/10/2021 REG. NO. 48768

**RFC ENGINEERING, INC.**  
**Consulting Engineers**

13635 Johnson Street  
 Ham Lake, MN 55304  
 Telephone 763-862-8000  
 Fax 763-862-8042

**HAM LAKE IMPROVEMENT PROJECT 1907**  
 LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
 159TH AVE NE, 160TH LN NE, AND OTHERS

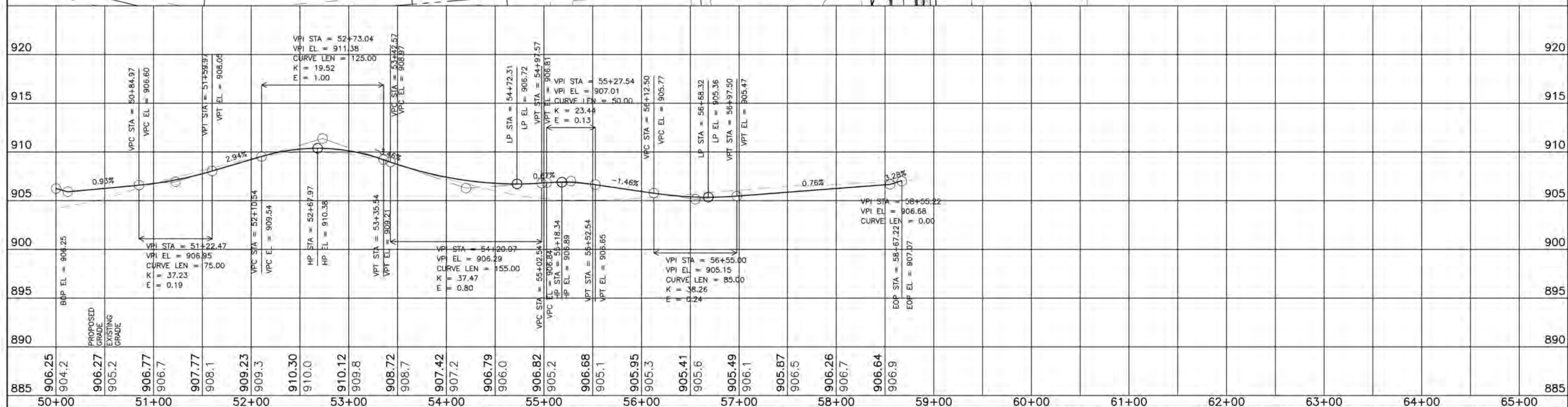
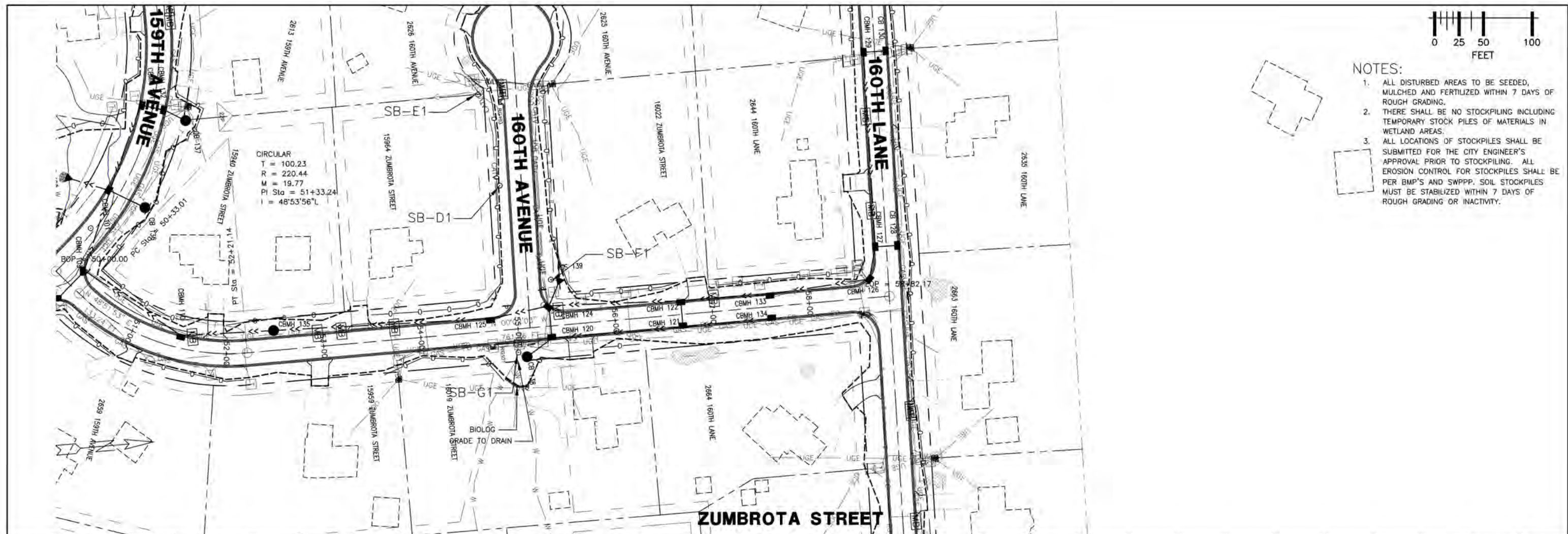
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**JOB NUMBER:** 1907  
**SHEET:** 19 OF 44  
**FILE:** 35-1-148

DESIGN BY: GJM

DRAWN BY: GJM

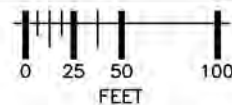
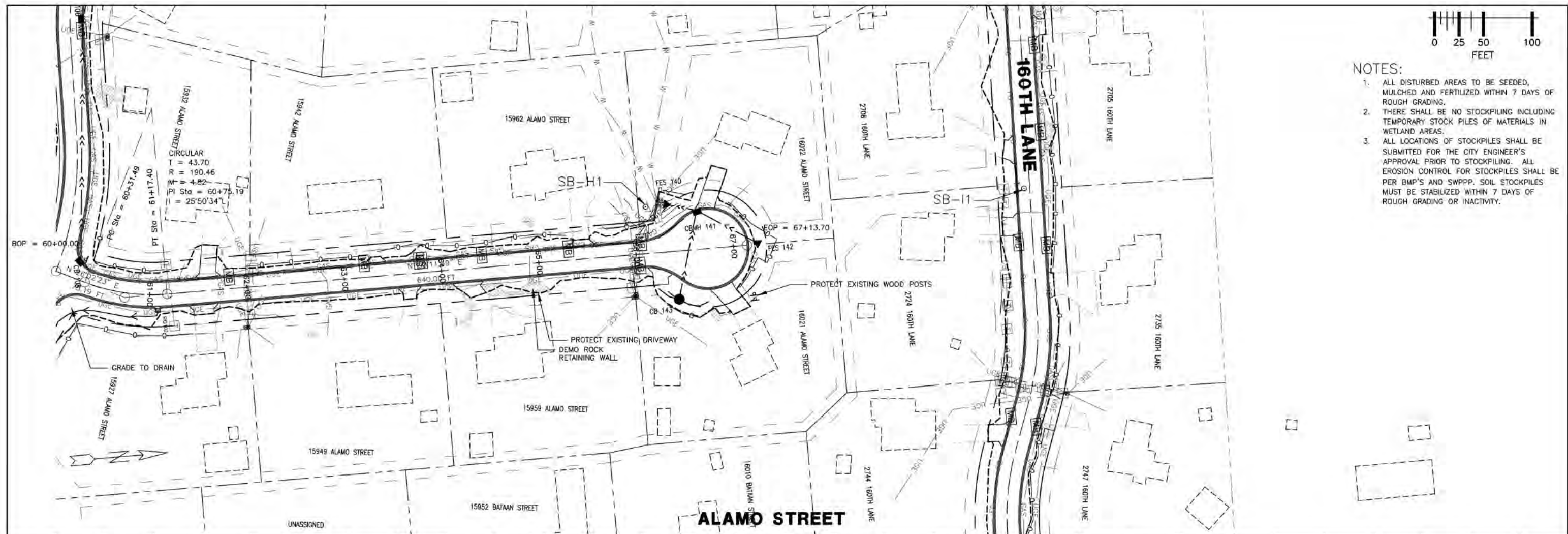
CHECKED BY: TPC





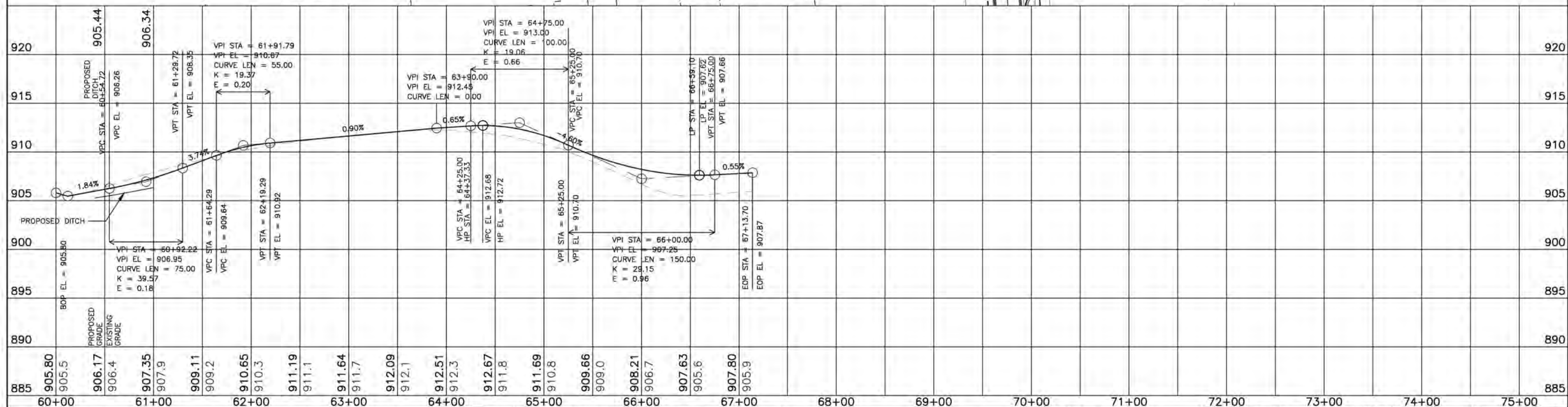
| <p><b>OPHER STATE CALL</b><br/>         800-252-1166 651-454-0002<br/> <small>PLOT DATE: 5/11/2021 13:14</small></p>                                  | <p><b>UTILITIES:</b></p> <table border="0"> <tr> <td>CENTURYLINK</td> <td>(763) 712-5017</td> </tr> <tr> <td>CENTERPOINT ENERGY</td> <td>(763) 323-2760</td> </tr> <tr> <td>COMCAST</td> <td>(952) 607-4078</td> </tr> <tr> <td>CONNEXUS ENERGY</td> <td>(763) 323-4268</td> </tr> <tr> <td>XCEL ENERGY</td> <td>(612) 526-4508</td> </tr> </table> | CENTURYLINK                                                                                                                   | (763) 712-5017 | CENTERPOINT ENERGY | (763) 323-2760 | COMCAST | (952) 607-4078 | CONNEXUS ENERGY | (763) 323-4268 | XCEL ENERGY | (612) 526-4508 | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>DATE</th> <th>REVISION HISTORY</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table> | DATE | REVISION HISTORY |  |  |  |  |  |  | <p>HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.</p> <p><i>Dave Krueger</i><br/>         DATE 5/10/2021 REG. NO. 48768</p> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------|----------------|---------|----------------|-----------------|----------------|-------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------------|--|--|--|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CENTURYLINK                                                                                                                                           | (763) 712-5017                                                                                                                                                                                                                                                                                                                                      |                                                                                                                               |                |                    |                |         |                |                 |                |             |                |                                                                                                                                                                                                                                                                     |      |                  |  |  |  |  |  |  |                                                                                                                                                                                                                                                              |
| CENTERPOINT ENERGY                                                                                                                                    | (763) 323-2760                                                                                                                                                                                                                                                                                                                                      |                                                                                                                               |                |                    |                |         |                |                 |                |             |                |                                                                                                                                                                                                                                                                     |      |                  |  |  |  |  |  |  |                                                                                                                                                                                                                                                              |
| COMCAST                                                                                                                                               | (952) 607-4078                                                                                                                                                                                                                                                                                                                                      |                                                                                                                               |                |                    |                |         |                |                 |                |             |                |                                                                                                                                                                                                                                                                     |      |                  |  |  |  |  |  |  |                                                                                                                                                                                                                                                              |
| CONNEXUS ENERGY                                                                                                                                       | (763) 323-4268                                                                                                                                                                                                                                                                                                                                      |                                                                                                                               |                |                    |                |         |                |                 |                |             |                |                                                                                                                                                                                                                                                                     |      |                  |  |  |  |  |  |  |                                                                                                                                                                                                                                                              |
| XCEL ENERGY                                                                                                                                           | (612) 526-4508                                                                                                                                                                                                                                                                                                                                      |                                                                                                                               |                |                    |                |         |                |                 |                |             |                |                                                                                                                                                                                                                                                                     |      |                  |  |  |  |  |  |  |                                                                                                                                                                                                                                                              |
| DATE                                                                                                                                                  | REVISION HISTORY                                                                                                                                                                                                                                                                                                                                    |                                                                                                                               |                |                    |                |         |                |                 |                |             |                |                                                                                                                                                                                                                                                                     |      |                  |  |  |  |  |  |  |                                                                                                                                                                                                                                                              |
|                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                               |                |                    |                |         |                |                 |                |             |                |                                                                                                                                                                                                                                                                     |      |                  |  |  |  |  |  |  |                                                                                                                                                                                                                                                              |
|                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                               |                |                    |                |         |                |                 |                |             |                |                                                                                                                                                                                                                                                                     |      |                  |  |  |  |  |  |  |                                                                                                                                                                                                                                                              |
|                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                               |                |                    |                |         |                |                 |                |             |                |                                                                                                                                                                                                                                                                     |      |                  |  |  |  |  |  |  |                                                                                                                                                                                                                                                              |
| <p><b>RFC ENGINEERING, INC.</b><br/>         Consulting Engineers</p>                                                                                 |                                                                                                                                                                                                                                                                                                                                                     | <p>13635 Johnson Street<br/>         Ham Lake, MN 55304<br/>         Telephone 763-862-8000<br/>         Fax 763-862-8042</p> |                |                    |                |         |                |                 |                |             |                |                                                                                                                                                                                                                                                                     |      |                  |  |  |  |  |  |  |                                                                                                                                                                                                                                                              |
| <p>HAM LAKE IMPROVEMENT PROJECT 1907<br/>         LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION<br/>         159TH AVE NE, 160TH LN NE, AND OTHERS</p> |                                                                                                                                                                                                                                                                                                                                                     | <p>ZUMBROTA STREET PLAN AND PROFILE</p>                                                                                       |                |                    |                |         |                |                 |                |             |                |                                                                                                                                                                                                                                                                     |      |                  |  |  |  |  |  |  |                                                                                                                                                                                                                                                              |
| <p>DESIGN BY: GJM</p>                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                     | <p>DRAWN BY: GJM</p>                                                                                                          |                |                    |                |         |                |                 |                |             |                |                                                                                                                                                                                                                                                                     |      |                  |  |  |  |  |  |  |                                                                                                                                                                                                                                                              |
| <p>CHECKED BY: TPC</p>                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                     | <p>FILE: 35-1-149</p>                                                                                                         |                |                    |                |         |                |                 |                |             |                |                                                                                                                                                                                                                                                                     |      |                  |  |  |  |  |  |  |                                                                                                                                                                                                                                                              |



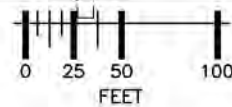
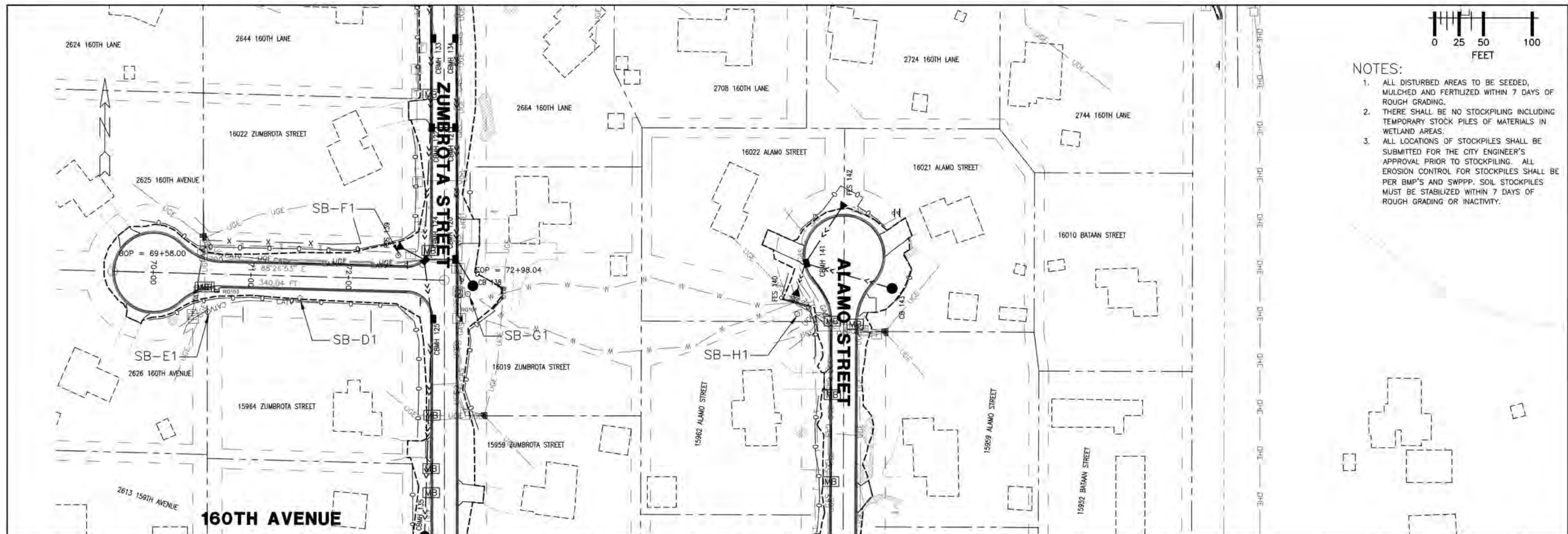


# NOTES:

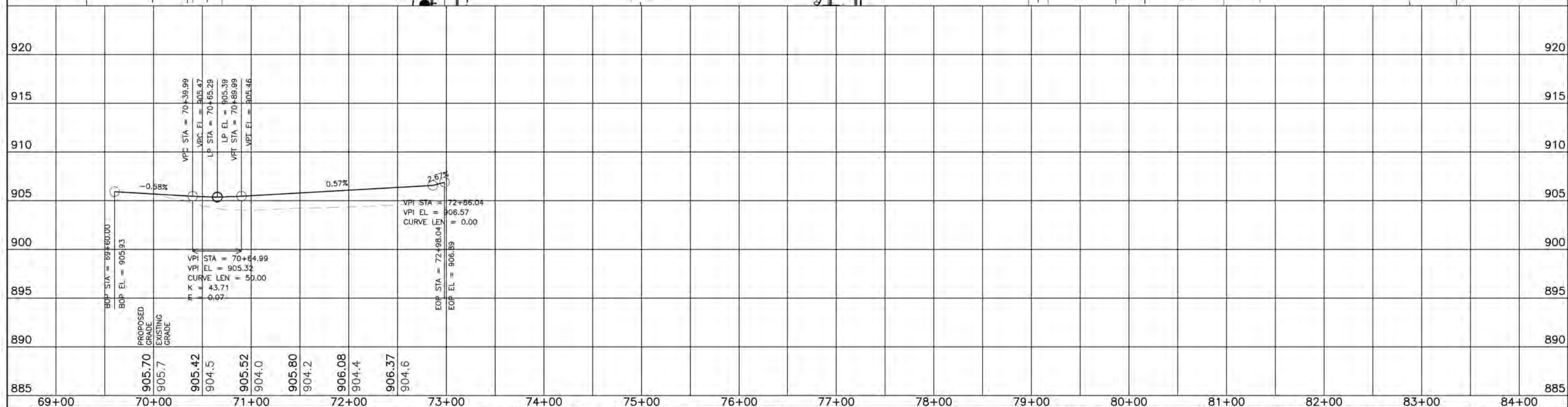
- ALL DISTURBED AREAS TO BE SEEDED, MULCHED AND FERTILIZED WITHIN 7 DAYS OF ROUGH GRADING.
- THERE SHALL BE NO STOCKPILING INCLUDING TEMPORARY STOCK PILES OF MATERIALS IN WETLAND AREAS.
- ALL LOCATIONS OF STOCKPILES SHALL BE SUBMITTED FOR THE CITY ENGINEER'S APPROVAL PRIOR TO STOCKPILING. ALL EROSION CONTROL FOR STOCKPILES SHALL BE PER BMP'S AND SWPPP. SOIL STOCKPILES MUST BE STABILIZED WITHIN 7 DAYS OF ROUGH GRADING OR INACTIVITY.



|                                                                                   |                                                                                                                                                                      |                                      |                                                                                                                                                                                                                        |                                                      |                                                                                          |                                                                                                                                                             |                                                                                          |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| <br><b>800-252-1166 651-454-0002</b><br><small>PLOT DATE: 5/11/2021 13:14</small> | UTILITIES: CENTURYLINK (763) 712-5017<br>CENTERPOINT ENERGY (763) 323-2760<br>COMCAST (952) 607-4078<br>CONNEXUS ENERGY (763) 323-4268<br>XCEL ENERGY (612) 526-4508 | DATE: 5/10/2021<br>REVISION HISTORY: | I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.<br><br>DATE 5/10/2021 REG. NO. 48768 | <b>RFC ENGINEERING, INC.</b><br>Consulting Engineers | 13635 Johnson Street<br>Ham Lake, MN 55304<br>Telephone 763-862-8000<br>Fax 763-862-8042 | HAM LAKE IMPROVEMENT PROJECT 1907<br>LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION<br>159TH AVE NE, 160TH LN NE, AND OTHERS<br>ALAMO STREET PLAN AND PROFILE | DWG: RCP01004<br>DATE: 05/06/21<br>JOB NUMBER: 1907<br>SHEET: 21 OF 44<br>FILE: 35-1-150 |
|                                                                                   | DESIGN BY: GJM DRAWN BY: GJM CHECKED BY: TPC                                                                                                                         |                                      |                                                                                                                                                                                                                        |                                                      |                                                                                          |                                                                                                                                                             |                                                                                          |



- NOTES:
1. ALL DISTURBED AREAS TO BE SEED, MULCHED AND FERTILIZED WITHIN 7 DAYS OF ROUGH GRADING.
  2. THERE SHALL BE NO STOCKPILING INCLUDING TEMPORARY STOCK PILES OF MATERIALS IN WETLAND AREAS.
  3. ALL LOCATIONS OF STOCKPILES SHALL BE SUBMITTED FOR THE CITY ENGINEER'S APPROVAL PRIOR TO STOCKPILING. ALL EROSION CONTROL FOR STOCKPILES SHALL BE PER BMP'S AND SWPPP. SOIL STOCKPILES MUST BE STABILIZED WITHIN 7 DAYS OF ROUGH GRADING OR INACTIVITY.





800-252-1166 651-454-0002

UTILITIES:

|                    |                |
|--------------------|----------------|
| CENTURYLINK        | (763) 712-5017 |
| CENTERPOINT ENERGY | (763) 323-2760 |
| COMCAST            | (952) 607-4078 |
| CONNEXUS ENERGY    | (763) 323-4268 |
| XCEL ENERGY        | (612) 526-4508 |

DATE

REVISION HISTORY

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Dave Krueger*

DATE 5/10/2021 REG. NO. 48768

**RFC ENGINEERING, INC.**

Consulting Engineers

13635 Johnson Street  
Ham Lake, MN 55304  
Telephone 763-862-8000  
Fax 763-862-8042

HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

160TH AVENUE PLAN AND PROFILE

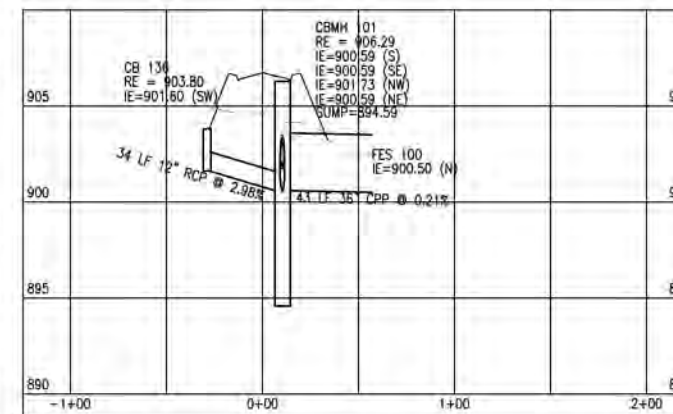
DWG: RCP01005  
DATE: 05/06/21  
JOB NUMBER: 1907  
SHEET: 22 OF 44  
FILE: 35-1-151

DESIGN BY: GJM  
DRAWN BY: GJM  
CHECKED BY: TPC

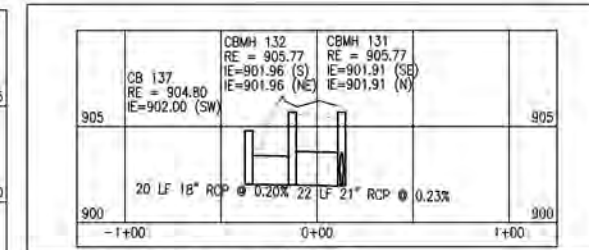


| STORM DRAIN |         |          |                   |           |                         |        |                                    |                              |            |            |            |            |            |           |            |             |       |          |        |        |
|-------------|---------|----------|-------------------|-----------|-------------------------|--------|------------------------------------|------------------------------|------------|------------|------------|------------|------------|-----------|------------|-------------|-------|----------|--------|--------|
| STRUCTURE   | STATION | LOCATION | SIZE OF STRUCTURE | DESIGN    | TOP OF CASTING OR INLET | INVERT | CASTING ASSEMBLY (NEENAH, EJ, DL)* | TYPE GRATE (NEENAH CASTINGS) | 12" R.C.P. | 15" R.C.P. | 18" R.C.P. | 21" R.C.P. | 30" R.C.P. | 36" C.P.P | PIPE APRON | TRASH GUARD | APRON | FLOWS TO | INLET  | % GRAD |
|             |         |          |                   |           |                         |        |                                    |                              | LIN FT     | LIN FT     | LIN FT     | LIN FT     | LIN FT     | LIN FT    |            |             |       |          |        |        |
| CB 137      | 12+76.1 | LT.      | 48" ø             | RFC-465C1 | 904.8                   | 902    | R-2577                             | C                            |            |            |            |            |            |           |            |             |       |          |        |        |
|             |         |          |                   |           |                         |        |                                    |                              |            |            | 20         |            |            |           |            |             |       | CBMH 132 | 901.96 | 0.2    |
| CBMH 132    | 12+70.8 | LT.      | 48" ø             | RFC-465A1 | 905.77                  | 901.96 | R-3246                             | L                            |            |            |            |            |            |           |            |             |       |          |        |        |
|             |         |          |                   |           |                         |        |                                    |                              |            |            |            | 22         |            |           |            |             |       | CBMH 131 | 901.91 | 0.23   |
| CBMH 131    | 12+70.8 | RT.      | 48" ø             | RFC-465A1 | 905.77                  | 901.91 | R-3246                             | L                            |            |            |            |            |            |           |            |             |       |          |        |        |
|             |         |          |                   |           |                         |        |                                    |                              |            |            |            | 87         |            |           |            |             |       | CBMH 101 | 901.73 | 0.21   |
| CB 108      | 19+71.9 | LT.      | 2' x 3'           | RFC-459B  | 905.36                  | 902.25 | R-3246                             | L                            |            |            |            |            |            |           |            |             |       |          |        |        |
|             |         |          |                   |           |                         |        |                                    |                              |            | 244        |            |            |            |           |            |             |       | CBMH 106 | 901.76 | 0.2    |
| CBMH 106    | 17+28.9 | LT.      | 48" ø             | RFC-465A1 | 905.52                  | 901.76 | R-3246                             | L                            |            |            |            |            |            |           |            |             |       |          |        |        |
|             |         |          |                   |           |                         |        |                                    |                              |            | 132        |            |            |            |           |            |             |       | CBMH 105 | 901.50 | 0.2    |
| CB 107      | 15+85.3 | RT.      | 2' x 3'           | RFC-459B  | 904.84                  | 901.05 | R-3246                             | L                            |            |            |            |            |            |           |            |             |       |          |        |        |
|             |         |          |                   |           |                         |        |                                    |                              | 23         |            |            |            |            |           |            |             |       | CBMH 105 | 901    | 0.20   |
| CBMH 105    | 15+85.3 | LT.      | 48" ø             | RFC-465A1 | 904.84                  | 901    | R-3246                             | L                            |            |            |            |            |            |           |            |             |       |          |        |        |
|             |         |          |                   |           |                         |        |                                    |                              |            |            |            | 88         |            |           |            |             |       | CBMH 104 | 900.83 | 0.2    |
| CB 136      | 13+64.8 | LT.      | 48" ø             | RFC-465C1 | 903.8                   | 901.6  | R-2577                             | C                            |            |            |            |            |            |           |            |             |       |          |        |        |
|             |         |          |                   |           |                         |        |                                    |                              | 34         |            |            |            |            |           |            |             |       | CBMH 101 | 900.59 | 2.98   |
| CBMH 104    | 14+88.7 | LT.      | 48" ø             | RFC-465A1 | 905.3                   | 900.83 | R-3246                             | L                            |            |            |            |            |            |           |            |             |       |          |        |        |
|             |         |          |                   |           |                         |        |                                    |                              |            |            |            | 34         |            |           |            |             |       | CBMH 103 | 900.75 | 0.21   |
| CBMH 103    | 14+48.5 | LT.      | 96" ø             | RFC-465A2 | 905.57                  | 900.75 | R-3246                             | L                            |            |            |            |            |            |           |            |             |       |          |        |        |
|             |         |          |                   |           |                         |        |                                    |                              |            |            |            |            | 79         |           |            |             |       | CBMH 101 | 900.59 | 0.21   |
| CBMH 101    | 13+68   | RT.      | 96" ø             | RFC-465A2 | 906.29                  | 900.59 | R-3246                             | L                            |            |            |            |            |            | 38        | 5          |             | 1     | FES 100  | 900.5  | 0.21   |
| RG 102      | 61+07.7 | RT.      | 5' x 2.5'         | BUNKER    | 907.19                  | 906.19 | -                                  | -                            |            |            |            |            |            |           |            |             |       |          |        |        |
| TOTAL       |         |          |                   |           |                         |        |                                    |                              | 57         | 376        | 20         | 231        | 79         | 38        | 5          | 0           | 1     |          |        |        |

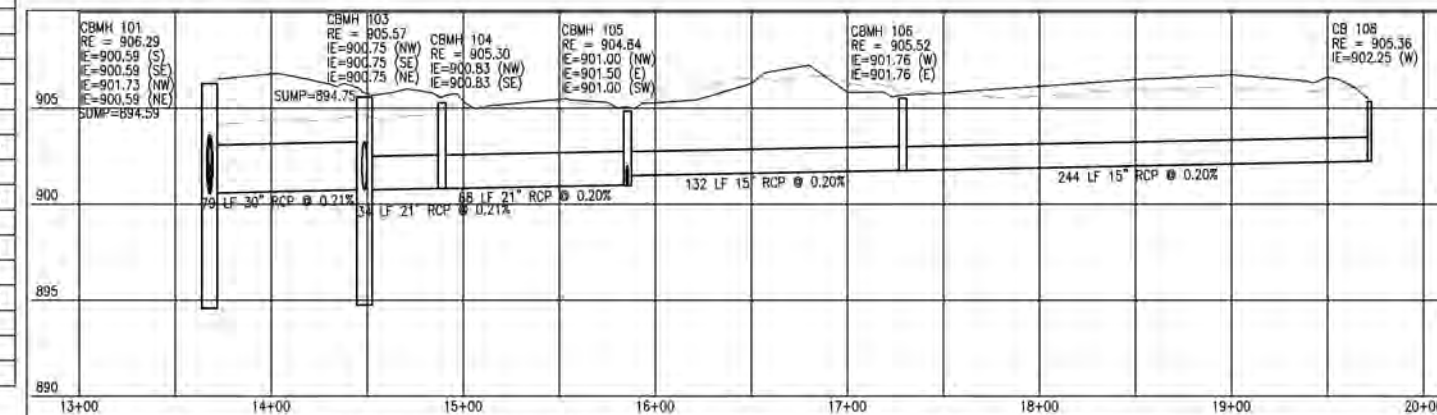
\*NEENAH FOUNDRY R-3246; EAST JORDAN IRON WORKS V-4520; D&L FOUNDRY I-1804.



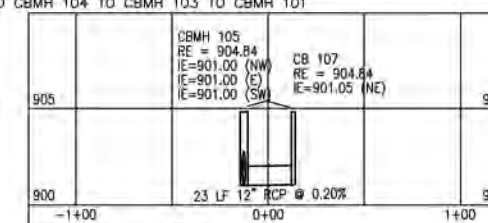
CB 136 TO CBMH 101 TO FES 100



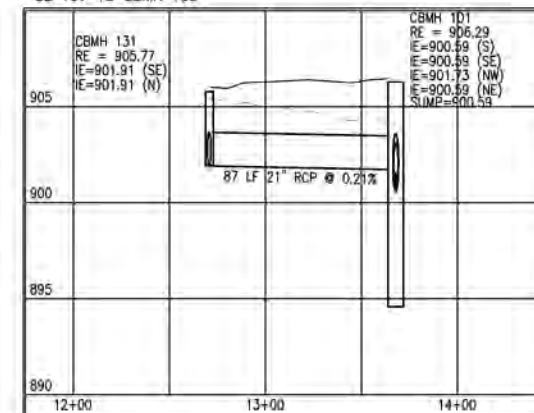
CBMH 137 TO CBMH 132 TO CBMH 131



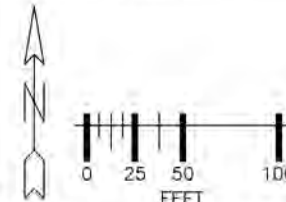
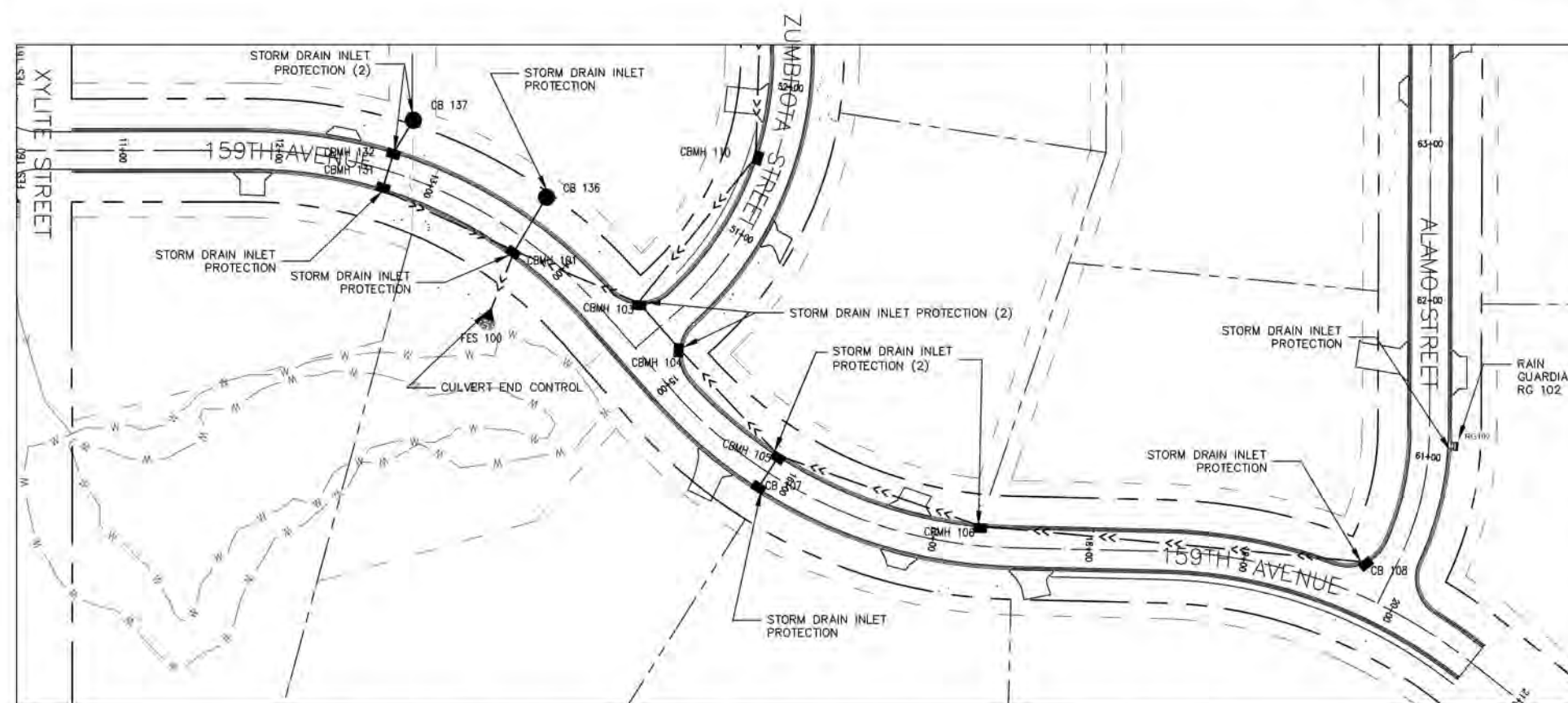
CBMH 108 TO CBMH 106 TO CBMH 105 TO CBMH 104 TO CBMH 103 TO CBMH 101



CB 107 TO CBMH 105



CBMH 131 TO CBMH 101



- NOTES:
1. ALL GRADING OPERATIONS SHALL BE CONDUCTED IN A MANNER TO MINIMIZE THE POTENTIAL FOR SITE EROSION.
  2. ALL EXPOSED SOIL AREAS MUST BE STABILIZED AS SOON AS POSSIBLE TO LIMIT SOIL EROSION BUT IN NO CASE MORE THAN 7 DAYS.
  3. SLOPES SHOWN ARE FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE

\*PIPE LENGTHS IN PROFILE VIEW INCLUDE PIPE AND APRON



UTILITIES: CENTURYLINK (763) 712-5017  
CENTERPOINT ENERGY (763) 323-2760  
COMCAST (952) 607-4078  
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XCEL ENERGY (612) 526-4508

DATE REVISION HISTORY

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*Dave Krueger*  
DATE 5/10/2021 REG. NO. 48768

**RFC ENGINEERING, INC.**  
Consulting Engineers

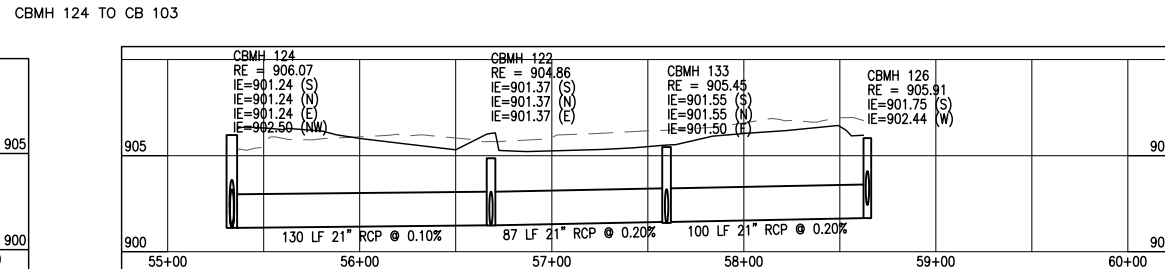
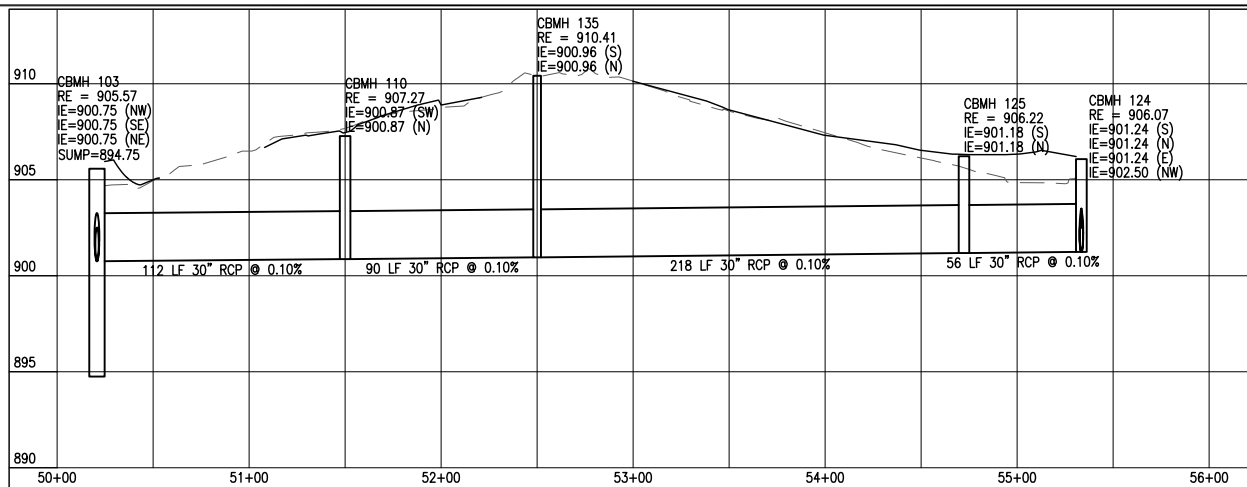
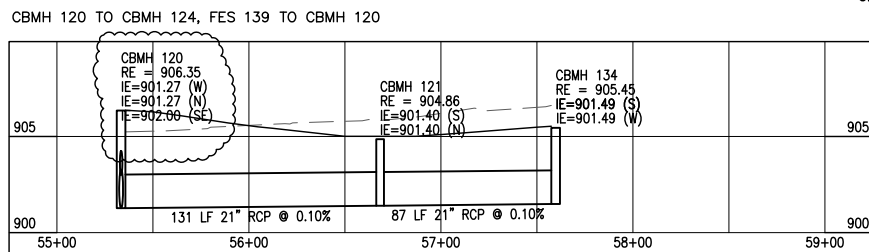
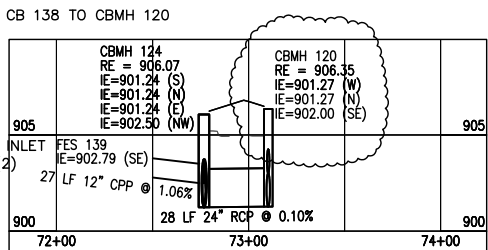
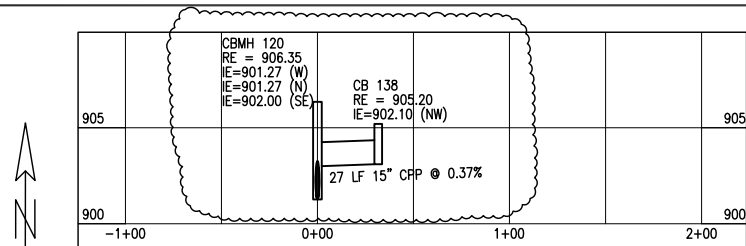
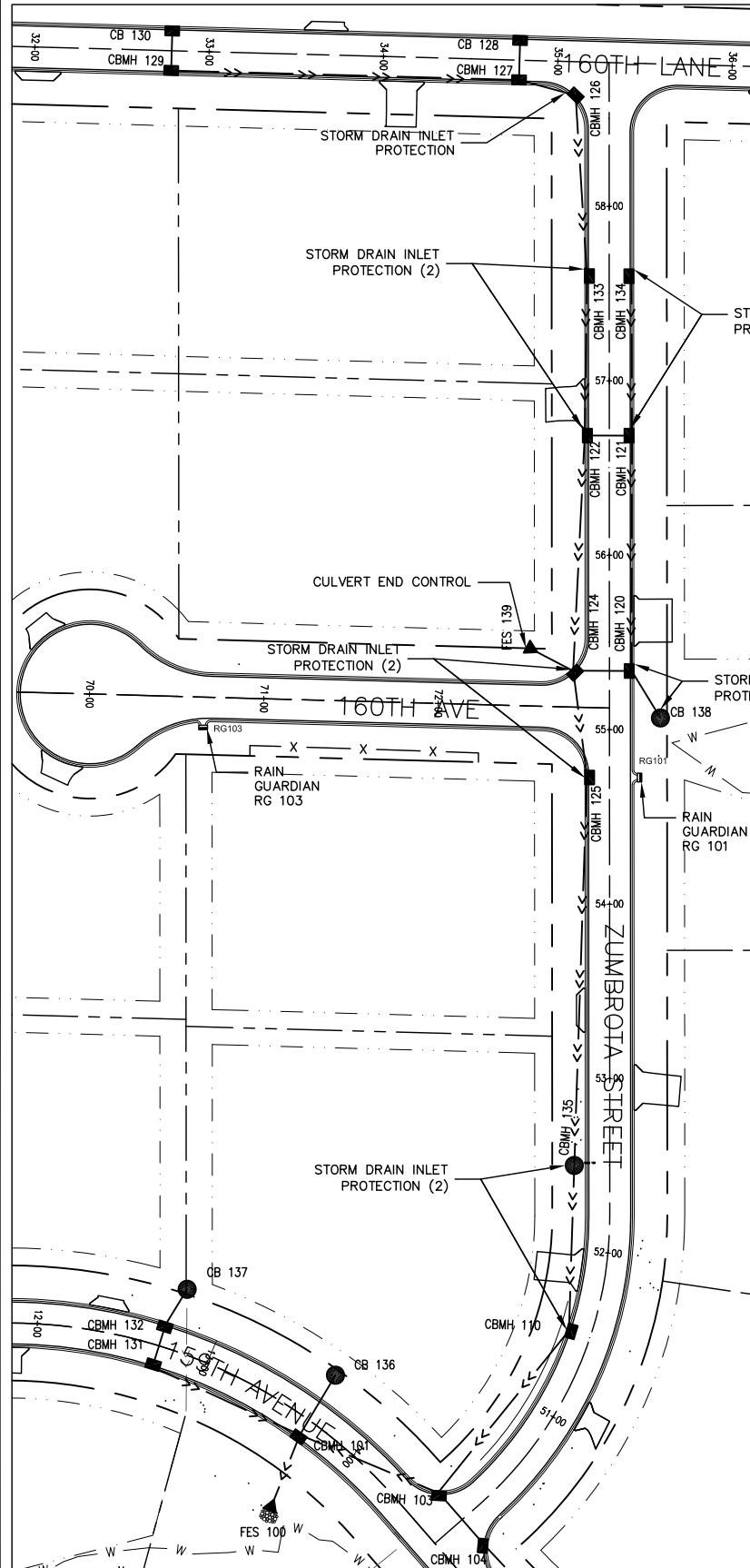
13635 Johnson Street  
Ham Lake, MN 55304  
Telephone 763-862-8000  
Fax 763-862-8042

HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

STORM DRAIN TABULATIONS

DESIGN BY: GJM DRAWN BY: GJM CHECKED BY: TPC

DWG: 1907 STORM 1  
DATE: 05/06/21  
JOB NUMBER: 1907  
SHEET: 23 OF 44  
FILE: 35-1-152



CBMH 126 TO CBMH 124

### STORM DRAIN

| STRUCTURE  | STATION | LOCATION | SIZE OF STRUCTURE | DESIGN    | TOP OF CASTING OR INLET | INVERT | CASTING ASSEMBLY (NEENAH, EJ, DL)* | TYPE GRATE (NEENAH CASTINGS) | 21" R.C.P. | 24" R.C.P. | 30" R.C.P. | 12" C.P.P. | 15" C.P.P. | PIPE APRON | TRASH GUARD | APRON | FLOWS TO | INLET  | % GRADE |
|------------|---------|----------|-------------------|-----------|-------------------------|--------|------------------------------------|------------------------------|------------|------------|------------|------------|------------|------------|-------------|-------|----------|--------|---------|
|            |         |          |                   |           |                         |        |                                    |                              | LIN FT     | LIN FT     | LIN FT     | LIN FT     | LIN FT     |            |             |       |          |        |         |
| CBMH 126   | 58+64.4 | LT.      | 48" ø             | RFC-465A1 | 905.91                  | 901.75 | R-3246                             | L                            | 100        |            |            |            |            |            |             |       | CBMH 133 | 901.55 | 0.2     |
| CBMH 134   | 57+59.8 | LT.      | 54" ø             | RFC-465A1 | 905.45                  | 901.49 | R-3246                             | L                            | 87         |            |            |            |            |            |             |       | CBMH 121 | 901.40 | 0.1     |
| CBMH 121   | 56+68.3 | LT.      | 48" ø             | RFC-465A1 | 904.86                  | 901.4  | R-3246                             | L                            | 131        |            |            |            |            |            |             |       | CBMH 120 | 901.27 | 0.1     |
| CBMH 120   | 55+33.4 | LT.      | 54" ø             | RFC-465A1 | 906.35                  | 901.27 | R-3246                             | L                            |            | 28         |            |            |            |            |             |       | CBMH 124 | 901.24 | 0.1     |
| CBMH 134** | 57+59.7 | LT.      | 54" ø             | RFC-465A1 | 905.45                  | 901.49 | R-3246                             | L                            | 21         |            |            |            |            |            |             |       | CBMH 133 | 901.5  | -0.05   |
| CBMH 133   | 57+59.8 | LT.      | 54" ø             | RFC-465A1 | 905.45                  | 901.55 | R-3246                             | L                            | 87         |            |            |            |            |            |             |       | CBMH 122 | 901.37 | 0.2     |
| CBMH 121** | 56+68.3 | LT.      | 48" ø             | RFC-465A1 | 904.86                  | 901.4  | R-3246                             | L                            | 23         |            |            |            |            |            |             |       | CBMH 122 | 901.37 | 0.13    |
| CBMH 122   | 56+68.3 | LT.      | 54" ø             | RFC-465A1 | 904.86                  | 901.37 | R-3246                             | L                            | 130        |            |            |            |            |            |             |       | CBMH 124 | 901.24 | 0.1     |
| FES 139    | 55+47.4 | LT.      |                   | FES       |                         | 902.79 | -                                  | -                            |            |            |            | 26         |            | 1.8        | 1           | 1     | CBMH 124 | 902.5  | 1.06    |
| CBMH 124   | 55+33.4 | LT.      | 66" ø             | RFC-465A1 | 906.07                  | 901.24 | R-3246                             | L                            |            |            | 56         |            |            |            |             |       | CBMH 125 | 901.18 | 0.1     |
| CBMH 125   | 54+72.3 | LT.      | 66" ø             | RFC-465A1 | 906.22                  | 901.18 | R-3246                             | L                            |            |            | 218        |            |            |            |             |       | CBMH 135 | 900.96 | 0.1     |
| CBMH 135   | 52+50   | LT.      | 48" ø             | RFC-465C1 | 910.41                  | 900.96 | R-2577                             | L                            |            |            | 90         |            |            |            |             |       | CBMH 110 | 900.87 | 0.1     |
| CBMH 110   | 51+50   | LT.      | 66" ø             | RFC-465A1 | 907.27                  | 900.87 | R-3246                             | L                            |            |            | 112        |            |            |            |             |       | CBMH 103 | 900.75 | 0.1     |
| CB 138     | 55+06.4 | RT.      | 48" ø             | RFC-465C1 | 905.2                   | 902.1  | R-2577                             | C                            |            |            |            |            | 27         |            |             |       | CBMH 120 | 902.00 | 0.37    |
| RG 101     | 54+72.3 | RT.      | 5' x 2.5'         | BUNKER    | 906.33                  | 905.33 |                                    |                              |            |            |            |            |            |            |             |       |          |        |         |
| RG 103     | 70+64.9 | RT.      | 5' x 2.5'         | BUNKER    | 905.15                  | 904.15 |                                    |                              |            |            |            |            |            |            |             |       |          |        |         |
| TOTAL      |         |          |                   |           |                         |        |                                    |                              | 579        | 28         | 476        | 26         | 27         |            |             |       |          |        |         |

#### NOTES:

- ALL GRADING OPERATIONS SHALL BE CONDUCTED IN A MANNER TO MINIMIZE THE POTENTIAL FOR SITE EROSION.
- ALL EXPOSED SOIL AREAS MUST BE STABILIZED AS SOON AS POSSIBLE TO LIMIT SOIL EROSION BUT IN NO CASE MORE THAN 7 DAYS.

\*PIPE LENGTHS IN PROFILE VIEW INCLUDE PIPE AND APRON

\* NEENAH FOUNDRY R-3246; EAST JORDAN IRON WORKS V-4520; D&L FOUNDRY I-1804.  
\*\* LISTING CONTAINS SECONDARY OUTLET/INLET PIPE



800-252-1166 651-454-0002

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CENTERPOINT ENERGY (763) 323-2760  
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CONNEXUS ENERGY (763) 323-4268  
XCEL ENERGY (612) 526-4508

| DATE     | REVISION HISTORY |
|----------|------------------|
| 7/6/2021 | STORM ELEVATIONS |
|          |                  |
|          |                  |
|          |                  |

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
*Dore Krueger*  
DATE 6/3/2021 REG. NO. 48768

**RFC ENGINEERING, INC.**  
Consulting Engineers

13635 Johnson Street  
Ham Lake, MN 55304  
Telephone 763-862-8000  
Fax 763-862-8042

HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

STORM DRAIN PROFILES AND TABULATIONS

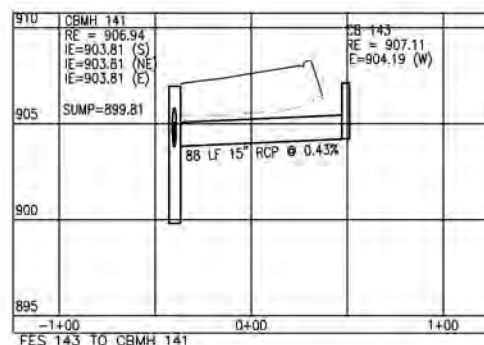
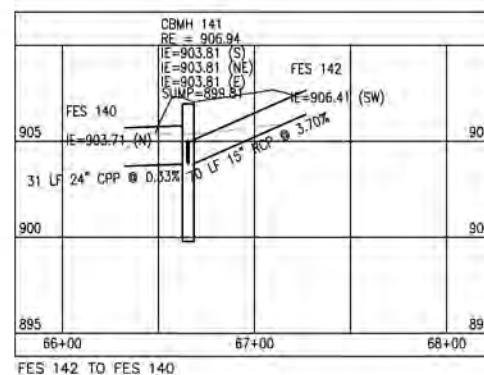
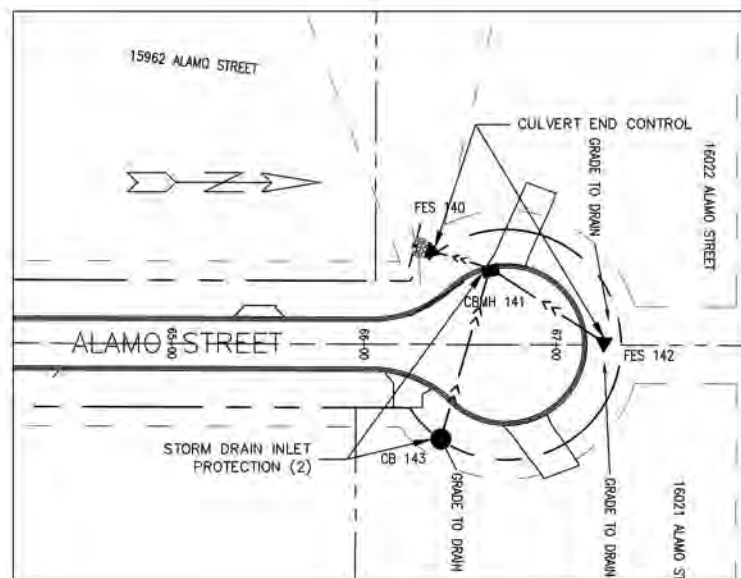
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DRAWN BY: GJM

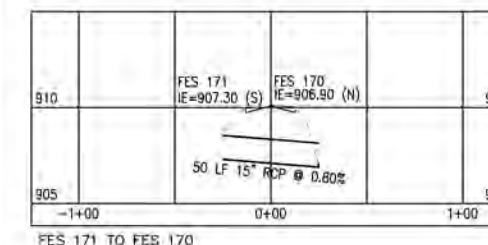
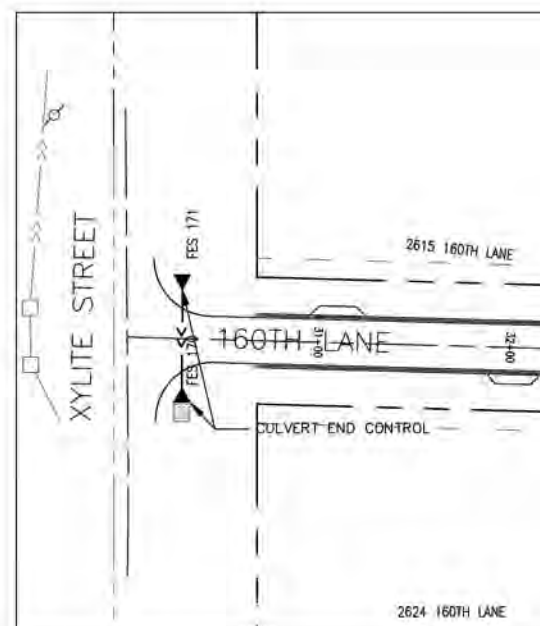
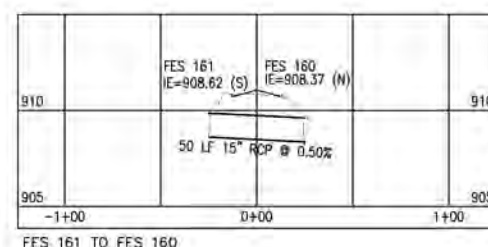
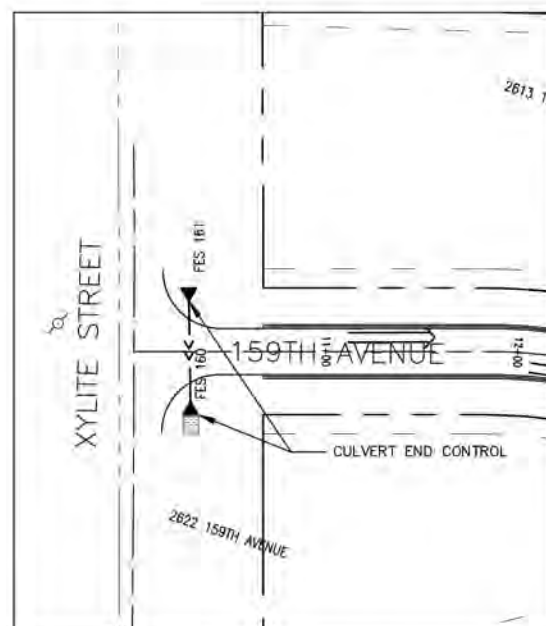
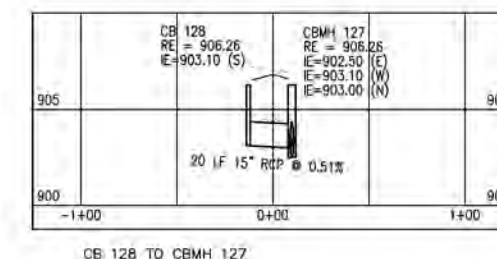
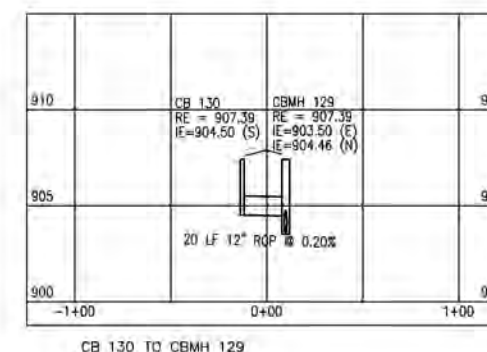
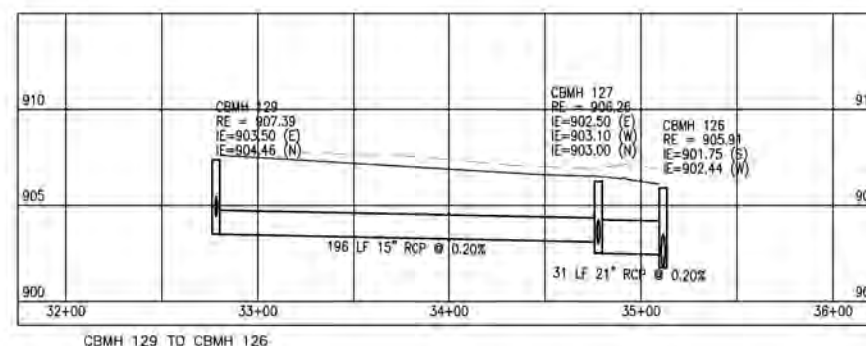
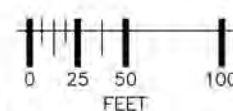
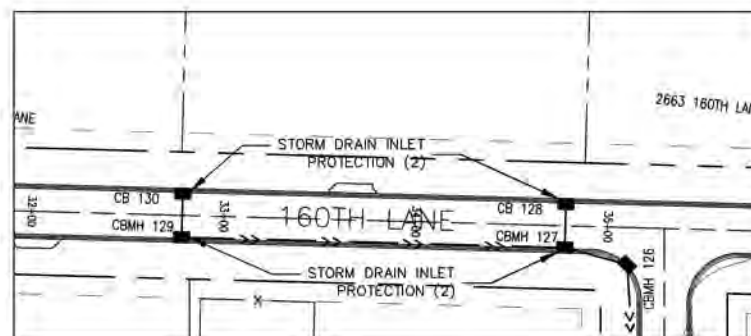
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DWG: 1907 STORM 2  
DATE: 05/06/21  
JOB NUMBER: 1907  
SHEET: 24 OF 44  
FILE: 35-1-XX





| STORM DRAIN |         |          |                   |           |                         |        |                                      |                              |            |            |            |            |            |             |       |                |         |      |
|-------------|---------|----------|-------------------|-----------|-------------------------|--------|--------------------------------------|------------------------------|------------|------------|------------|------------|------------|-------------|-------|----------------|---------|------|
| STRUCTURE   | STATION | LOCATION | SIZE OF STRUCTURE | DESIGN    | TOP OF CASTING OR INLET | INVERT | CASTING ASSEMBLY (NEENAH, E.J., DL)* | TYPE GRATE (NEENAH CASTINGS) | 12" R.C.P. | 15" R.C.P. | 21" R.C.P. | 24" C.P.P. | PIPE APRON | TRASH GUARD | APRON | FLOWS TO INLET | % GRADE |      |
|             |         |          |                   |           |                         |        |                                      |                              | LIN FT     | LIN FT     | LIN FT     | LIN FT     | LIN FT     | EACH        | EACH  |                |         |      |
| CB 143      | 66+40   | RT.      | 48" ø             | RFC-465C1 | 907.11                  | 904.19 | R-2577                               | C                            |            | 88         |            |            |            |             |       | CBMH 141       | 903.81  | 0.43 |
| FES 142     | 67+26.7 | LT.      |                   | FES       |                         | 906.41 | —                                    | —                            |            | 64         |            |            | 6.1        | 1           | 1     | CBMH 141       | 903.81  | 3.7  |
| CBMH 141    | 66+65.3 | LT.      | 72" ø             | RFC-465B3 | 906.94                  | 903.81 | R-3501-TB                            | C                            |            |            |            | 28         | 3.4        | 1           | 1     | FES 140        | 903.71  | 0.33 |
| CB 130      | 32+78.2 | LT.      | 2' x 3'           | RFC-459B  | 907.39                  | 904.5  | R-3246                               | C                            | 20         |            |            |            |            |             |       | CBMH 129       | 904.46  | 0.2  |
| CBMH 129    | 32+78.2 | RT.      | 48" ø             | RFC-465A1 | 907.39                  | 903.5  | R-3246                               | C                            |            | 196        |            |            |            |             |       | CBMH 127       | 903.10  | 0.2  |
| CB 128      | 34+77.8 | LT.      | 2' x 3'           | RFC-459B  | 906.26                  | 903.1  | R-3246                               | C                            |            | 20         |            |            |            |             |       | CBMH 127       | 903     | 0.51 |
| CBMH 127    | 34+77.8 | RT.      | 48" ø             | RFC-465A1 | 906.26                  | 902.5  | R-3246                               | C                            |            |            | 31         |            |            |             |       | CBMH 126       | 902.44  | 0.2  |
| FES 161     | 10+28.7 | LT.      |                   | FES       |                         | 908.62 | —                                    | —                            |            | 37         |            |            | 12.2       |             | 2     | FES 160        | 908.37  | 0.5  |
| FES 171     | 30+28   | LT.      |                   | FES       |                         | 907.3  | —                                    | —                            |            | 38         |            |            | 12.2       |             | 2     | FES 170        | 906.9   | 0.8  |
| TOTAL       |         |          |                   |           |                         |        |                                      |                              | 20         | 443        | 31         | 28         |            | 2           | 6     |                |         |      |



#### NOTES:

1. ALL GRADING OPERATIONS SHALL BE CONDUCTED IN A MANNER TO MINIMIZE THE POTENTIAL FOR SITE EROSION.
2. ALL EXPOSED SOIL AREAS MUST BE STABILIZED AS SOON AS POSSIBLE TO LIMIT SOIL EROSION BUT IN NO CASE MORE THAN 7 DAYS.
3. SLOPES SHOWN ARE FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE.

\*PIPE LENGTHS IN PROFILE VIEW INCLUDE PIPE AND APRON

**Gopher State One Call**  
800-252-1166 651-454-0002

UTILITIES: CENTURYLINK (763) 712-5017  
CENTERPOINT ENERGY (763) 323-2760  
COMCAST (952) 607-4078  
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XCEL ENERGY (612) 526-4508

| DATE | REVISION HISTORY |
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I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
*Dave Krueger*  
DATE 5/10/2021 REG. NO. 48768

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Telephone 763-862-8000  
Fax 763-862-8042

HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

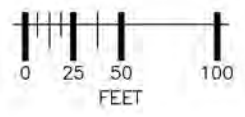
STORM DRAIN TABULATIONS

DESIGN BY: GJM DRAWN BY: GJM CHECKED BY: TPC

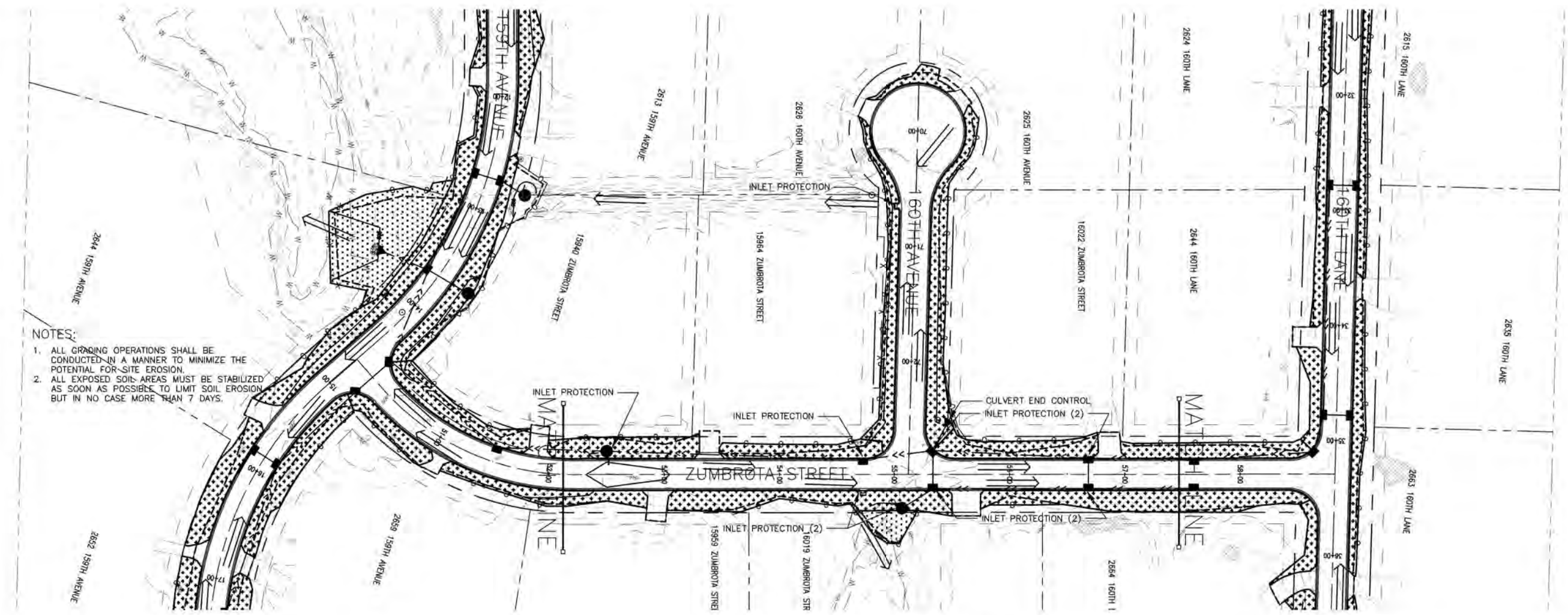
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DATE: 05/06/21  
JOB NUMBER: 1907  
SHEET: 25 OF 44  
FILE: 35-1-154







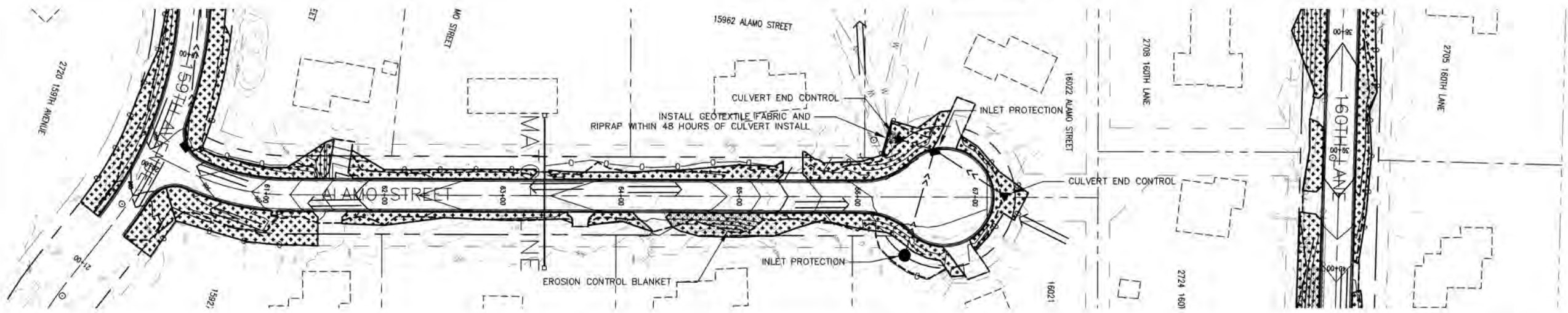
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CONSTRUCTION EXIT

- SEED MIX 25-151: RESIDENTIAL TURF  
MULCH TYPE 1  
PLANT APRIL 1ST - JUNE 1ST FOR SPRING PLANTING OR JULY 20TH - SEPTEMBER 20TH FOR FALL PLANTING
- SEED MIX 34-181: EMERGENT WETLAND  
MULCH TYPE 3  
PLANT APR 15TH - JUL 20TH FOR SPRING PLANTING OR SEPT 20TH - OCT 20TH FOR FALL PLANTING

EROSION CONTROL BLANKET



**Gopher State**  
**ONE CALL**  
800-252-1166 651-454-0002

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HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS  
STORMWATER POLLUTION PREVENTION PLAN

DESIGN BY: GJM DRAWN BY: GJM CHECKED BY: TPC

|                   |
|-------------------|
| DWG: 1907 SWPPP 2 |
| DATE: 05/06/21    |
| JOB NUMBER: 1907  |
| SHEET: 27 OF 44   |
| FILE: 35-1-156    |



STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

CONSTRUCTION ACTIVITY INFORMATION:

LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION, HAM LAKE, ANOKA COUNTY, MINNESOTA, 55304, 45.2527° LATITUDE NORTH, 93.2355° LONGITUDE WEST (BY ONLINE TOOL).

TOTAL PROJECT DISTURBED AREA IS 5.73 ACRES.

THIS IS A ROAD CONSTRUCTION PROJECT.

0.44 ACRES OF NEW IMPERVIOUS SURFACE.  
0.00 ACRES OF NEW PERVIOUS SURFACE.

DRAINAGE IS TO REGIONAL PONDS AND WETLANDS LOCATED THROUGHOUT THE PROJECT WITHIN DRAINAGE AND UTILITY EASEMENTS.

CONTACT INFORMATION:

OWNER: CITY OF HAM LAKE. OWNER CONTACT: DENISE WEBSTER, CITY ADMINISTRATOR, DWEBSTER@CLHAM-LAKE.MN.US, 763-235-1680, 15544 CENTRAL AVENUE, HAM LAKE, MN, 55304

ALTERNATE OWNER CONTACT: TOM COLLINS, CITY ENGINEER, TCOLLINS@RFCENGINEERING.COM 763-862-8000.  
RFC ENGINEERING INC, 13635 JOHNSON STREET NE, HAM LAKE, MN 55304

CONTRACTOR: \_\_\_\_\_

ALTERNATE CONTRACTOR CONTACT:

PARTY RESPONSIBLE FOR OPERATION AND MAINTENANCE OF PERMANENT STORMWATER MANAGEMENT SYSTEM: CITY OF HAM LAKE PUBLIC WORKS, JOHN WITKOWSKI, 763-235-1662, 15544 CENTRAL AVENUE, HAM LAKE, MN, 55304

GENERAL CONSTRUCTION PROJECT INFORMATION:

THE PROJECT CONSISTS OF STREET RECONSTRUCTION TO THE LUND'S LAKEVIEW FOREST DEVELOPMENT. CONCRETE CURB AND GUTTER, STORM SEWER AND STORMWATER POND CONSTRUCTION IS INCLUDED.

THE SOILS ON THE SITE ARE PRIMARILY HYDROLOGIC SOIL GROUP TYPE B WITH MODERATE INFILTRATION CAPACITY. THE GROUNDWATER IN THIS AREA IS LOW.

GENERAL SITE INFORMATION:

ALL EROSION CONTROL MEASURES MUST BE PLACED PRIOR TO COMMENCEMENT OF LAND DISTURBING ACTIVITIES AND BE MAINTAINED UNTIL ALL DISTURBED AREAS ON THE SITE HAVE BEEN RESTORED.

CONSTRUCTION EXITS SHALL BE SURFACED WITH CRUSHED ROCK AND DESIGNATED PRIOR TO CONSTRUCTION (REFER TO DETAIL).

TRENCHES FOR STORM DRAIN PIPE AND STRUCTURES ARE TO BE BACKFILLED BY THE END OF THE WORK DAY.

NO STORMWATER MITIGATION MEASURES ARE REQUIRED AS THE RESULT OF AN ENVIRONMENTAL, ARCHAEOLOGICAL, OR OTHER REQUIRED LOCAL, STATE, OR FEDERAL REVIEW OF THE PROJECT.

THE PROJECT IS NOT LOCATED IN A KARST AREA.

THE PROJECT DOES NOT DISCHARGE TO A CALcareous FEN LISTED IN MINN. R. 7050.0180, SUBP. 6B.

THE SITE DOES NOT DISCHARGE TO A WATER THAT IS LISTED AS IMPAIRED FOR PHOSPHORUS, TURBIDITY, DISSOLVED OXYGEN OR BIOTIC IMPAIRMENT.

SELECTION OF A PERMANENT STORMWATER MANAGEMENT SYSTEM:

NEW IMPERVIOUS SURFACE CREATED BY THIS PROJECT IS 0.44 ACRES.

PER COON CREEK WATERSHED DISTRICT, ANOKA CONSERVATION DISTRICT, AND MINNESOTA BOARD OF WATER AND SOIL RESOURCES, THERE IS INFILTRATION ON SITE DUE TO THE LOW GROUNDWATER TABLE AND HYDROLOGIC SOIL GROUP.

HYDROLOGIC REPORT (DRAINAGE CALCULATIONS) AND DRAINAGE MAPS (WITH DRAINAGE DIVIDES) PREPARED FOR THIS PROJECT ARE AVAILABLE IN THE CITY'S ENGINEERS OFFICE. STORM WATER RUNOFF FROM THE SITE DRAINS INTO THE REGIONAL PONDS AND INFILTRATE WITHIN THE PONDS. THE RUNOFF FROM THE SITE WILL BE CONVEYED VIA NEW ON SITE STORM DRAINS. THE LAST STORM DRAIN STRUCTURE JUST PRIOR TO DISCHARGE WILL BE EQUIPPED WITH A SUMP (GRIT CHAMBERS). THE SUMP (GRIT CHAMBERS) ARE SIZED PER COON CREEK WATERSHED DISTRICT REQUIREMENTS.

EROSION PREVENTION PRACTICES:

THERE ARE NO CONSTRUCTION PHASING, VEGETATIVE BUFFER STRIPS, LONG HORIZONTAL SLOPE GRADING FOR THE PROJECT. THERE ARE UNDISTURBED AREAS WITHIN THE PROJECT LIMITS.

ALL DISTURBED AREAS SHALL BE RESTORED WITH SOD, SEED, WOOD FIBER BLANKET, OR PAVED SURFACE WITHIN SEVEN (7) DAYS OF ROUGH GRADING.

ALL EXPOSED SOIL AREAS MUST HAVE TEMPORARY EROSION PROTECTION OR PERMANENT COVER WITHIN SEVEN (7) DAYS AFTER THE AREA IS NOT ACTIVELY BEING WORKED.

FERTILIZER: MnDOT SPECIFICATION 3881, TYPE 2 SEEDING: MnDOT SEED MIXTURE 25-131 OR 33-261 (FOR PONDS), HYDROMULCH: MnDOT SPECIFICATION 3884 TYPE 1 OR 3 WITH APPLICATION RATE PER MnDOT SPECIFICATION 2575.3H.

PROVIDE EROSION CONTROL FABRIC FOR ALL SLOPES STEEPER THAN 1:3.

THERE ARE NO DRAINAGE DITCHES CONSTRUCTED WITH THIS PROJECT.

SEDIMENT CONTROL PRACTICES:

THERE ARE SEDIMENT BASINS FOR THIS PROJECT.

THERE ARE NO SLOPES WITH A GRADE OF 1:3 OR STEEPER WITH A SLOPE LENGTH GREATER THAN 75 FEET.

THERE ARE NO DRAINAGE INFILTRATION BASINS FOR THIS PROJECT.

ALL SEDIMENT CONTROL DEVICES ARE TO BE IN PLACE PRIOR TO UPSTREAM LAND DISTURBING ACTIVITIES.

WITHIN 24 HOURS OF CONNECTION TO A SURFACE WATER, PIPE OUTLETS MUST CONTAIN RIPRAP, SEED AND PLACE EROSION CONTROL BLANKETS ON DISTURBED AREAS WITHIN 200 LINEAL FEET OF PIPE OUTLETS INCLUDING THE DOWN SLOPE TO THE PIPE OUTLET, SILT FENCING TO BE PLACED AROUND THE DISTURBED AREA AND SILT FENCE ROUTED ACROSS THE TOP OF THE OUTLET.

WITHIN 24 HOURS OF CONNECTION TO A SURFACE WATER, SEED AND PLACE EROSION CONTROL BLANKETS ON DISTURBED AREAS WITHIN 200 FEET OF PIPE INLET INCLUDING THE DOWN SLOPE TO THE PIPE INLET. SILT FENCING TO BE PLACED AROUND THE DISTURBED AREA, PLACE A SECOND SILT FENCE ROUTED ACROSS THE TOP OF THE INLET AND PLACE INLET PROTECTION. PIPE INLET PROTECTION SHALL BE PER BMPS SUCH AS SILT FENCE OR STRAW BALES STAKED AROUND THE APRON OPENING OR OTHER APPROVED EQUIVALENT.

WITHIN 24 HOURS OF CONNECTION TO A SURFACE WATER, SEED AND PLACE EROSION CONTROL BLANKETS ON DISTURBED AREAS WITHIN 200 FEET OF CATCH BASIN INLET. PLACE INLET PROTECTION IMMEDIATELY AFTER STRUCTURE IS BACKFILLED. CATCH

BASIN INLET PROTECTION SHALL BE PER BMPS SUCH AS CLEAR ROCK AROUND STEEL PLATE OVER FABRIC OR OTHER APPROVED EQUIVALENT UNTIL THE CATCH BASIN CASTING IS PLACED. IMMEDIATELY AFTER THE CASTING IS PLACED, PROVIDE CATCH BASIN INLET PROTECTION PER BMPS SUCH AS FILTER BAG INSERT OR OTHER APPROVED EQUIVALENT. NO CAPTURED SEDIMENT SHOULD BE ALLOWED TO DROP INTO THE CATCH BASIN.

PROVIDE SILT FENCE DOWNSTREAM OF STOCKPILE AREAS. STOCKPILES ARE NOT TO BLOCK DRAINAGE CONVEYANCE SYSTEMS. SOIL STOCKPILES MUST BE STABILIZED WITHIN 7 DAYS OF ROUGH GRADING OR INACTIVITY.

SEDIMENT TRACKED OFFSITE SHALL BE MINIMIZED AND SWEEPED ON A DAILY BASIS.

TEMPORARY SEDIMENTATION BASINS ARE NOT BEING USED TO REDUCE WETLAND IMPACTS, DUE TO THE LACK OF RIGHT OF WAY.

DEWATERING AND BASIN DRAINING:

ALL DEWATERING IS TO DISCHARGE TO SEDIMENT SACKS, ROCK WEEPER, BIO ROLL AREA, ETC. TO PREVENT EROSION AND MINIMIZE SEDIMENT DISCHARGING FROM THE SITE. EXCESSIVE SEDIMENT-LADEN WATER WILL NOT BE PERMITTED TO DISCHARGE FROM THE SITE. DEWATERING PRACTICES ARE NOT TO CAUSE DOWNSTREAM NUISANCE CONDITIONS, EROSION, OR NON-PERMITTED WETLAND INUNDATION CAUSING ADVERSE IMPACTS. DISCHARGE FROM DEWATERING WILL BE TO STORMWATER PONDS. LARGE VOLUMES OF DEWATERING WILL REQUIRE DISCHARGE INTO SEDIMENT SACKS PRIOR TO DISCHARGING INTO THE STORMWATER PONDS.

ADDITIONAL BMPS FOR SPECIAL WATERS AND DISCHARGES TO WETLANDS:

THE PROJECT DOES NOT DISCHARGE INTO OR WITHIN 1 MILE OF SPECIAL WATERS.

THERE ARE NO BUFFER ZONES OR UNDISTURBED AREA ZONES.

THE STORM DRAIN SYSTEM WAS SET UP TO DISTRIBUTE THE STORMWATER RUNOFF INTO THE PROJECT PONDS AS CLOSE TO EXISTING CONDITIONS AS POSSIBLE. THIS INCLUDED PROVIDING STORM DRAIN ON BOTH SIDES OF THE STREET IN ORDER TO ACHIEVE THIS. THE DRAINAGE WAS APPROVED BY COON CREEK WATERSHED DISTRICT.

THERE IS NO CONVERSION OF WETLANDS INTO STORMWATER PONDS.

INSPECTION AND MAINTENANCE:

THE CONTRACTOR SHALL PLACE A RAIN GAUGE ON THE PROJECT SITE AT A LOCATION APPROVED BY THE ENGINEER. RAINFALL DATA SHALL BE KEPT WITH THE SWPPP RECORDS.

THE CONTRACTOR MUST INSPECT THE CONSTRUCTION SITE ONCE EVERY SEVEN (7) DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS. INSPECTIONS AND MAINTENANCE TO BE RECORDED IN WRITING. THE SWPPP INSPECTION FOR THE CONSTRUCTION IS TO BE CONDUCTED BY \_\_\_\_\_ OF \_\_\_\_\_

INSPECTIONS FORMS ARE AVAILABLE AT:

<http://www.coastate.mn.us/index.php/water/water-types-and-programs/stormwater/construction-stormwater/construction-stormwater.html>  
THE ACTUAL FORM IS UNDER INSPECTION CHECKLIST.

THE CONTRACTOR WILL BE RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF TEMPORARY AND PERMANENT WATER QUALITY MANAGEMENT DEVICES, AS WELL AS ALL EROSION AND SEDIMENT CONTROL, FOR THE DURATION OF THE PROJECT.

THE CONTRACTOR WILL INVESTIGATE AND COMPLY WITH THE FOLLOWING:

SILT FENCE WILL BE REPAIRED, REPLACED, OR SUPPLEMENTED WHEN IT BECOMES NONFUNCTIONAL OR THE SEDIMENT REACHES 1/3 OF THE FENCE HEIGHT. THE CORRECTIONS MUST BE MADE WITHIN 24 HOURS OF DISCOVERY, OR AS SOON AS FIELD CONDITIONS ALLOW ACCESS.

SEDIMENT WILL BE REMOVED FROM SEDIMENTATION BASIN WHEN IT REACHES A DEPTH OF TWO FEET OR ONE-HALF OF THE STORAGE VOLUME, WHICHEVER IS LESS, WITHIN 72-HOURS OF DISCOVERY.

SEDIMENT DEPOSITED IN SURFACE WATERS WILL BE REMOVED WITHIN SEVEN (7) DAYS OF DISCOVERY. RESTABILIZING THE AREAS WHERE SEDIMENT REMOVAL RESULTS IN EXPOSED SOIL WILL BE COMPLETED WITHIN THE SAME SEVEN (7) DAY TIME FRAME.

CONSTRUCTION SITE VEHICLE EXIT LOCATIONS WILL BE INSPECTED FOR OFFSITE SEDIMENT TRACKING ONTO PAVED SURFACES. TRACKED SEDIMENT WILL BE REMOVED FROM THE PAVED SURFACE WITHIN 24 HOURS OF DISCOVERY.

OFFSITE ACCUMULATIONS OF SEDIMENT WILL BE REMOVED IN A TIMELY MANNER AND AT A FREQUENCY SUFFICIENT TO MINIMIZE OFFSITE IMPACTS.

POLLUTION PREVENTION MANAGEMENT MEASURES:

THE CONTRACTOR SHALL IMPLEMENT THE FOLLOWING POLLUTION PREVENTION MANAGEMENT MEASURES ON THE SITE:

SOLID WASTE: COLLECT SEDIMENT, ASPHALT AND CONCRETE MILLINGS, FLOATING DEBRIS, PAPER, PLASTIC, FABRIC, CONSTRUCTION AND DEMOLITION DEBRIS, AND OTHER WASTES MUST BE DISPOSED OF PROPERLY OFFSITE AND MUST COMPLY WITH MPCA DISPOSAL REQUIREMENTS.

HAZARDOUS MATERIALS: OIL, GASOLINE, PAINT AND ANY HAZARDOUS SUBSTANCES MUST BE PROPERLY STORED, INCLUDING SECONDARY CONTAINMENT, TO PREVENT SPILLS, LEAKS OR OTHER DISCHARGE. RESTRICTED ACCESS TO STORAGE AREAS MUST BE PROVIDED TO PREVENT VANDALISM. STORAGE AND DISPOSAL OF HAZARDOUS WASTE MUST BE IN COMPLIANCE WITH MPCA REGULATIONS.

EXTERNAL WASHING OF TRUCKS, INCLUDING CONCRETE DELIVERY TRUCKS, AND OTHER CONSTRUCTION VEHICLES MUST BE LIMITED TO A DEFINED AREA OF THE SITE. RUNOFF MUST BE CONTAINED AND WASTE PROPERLY DISPOSED OF. NO ENGINE DEGREASING IS ALLOWED ON SITE. CONCRETE WASHOUT ON SITE MUST BE CONTAINED IN A LEAK-PROOF CONTAINMENT FACILITY OR IMPERMEABLE LINER.

THE CITY IS RESPONSIBLE FOR LONG TERM MAINTENANCE OF THE STORM DRAIN INCLUDING THE SUMPS (GRIT CHAMBERS). THE GRIT CHAMBERS ARE TO BE INSPECTED YEARLY AND CLEANED OUT AS NECESSARY TO MAINTAIN FUNCTION.

THE CONTRACTOR IS RESPONSIBLE FOR MONITORING AIR POLLUTION AND ENSURING IT DOES NOT EXCEED LEVELS SET BY LOCAL, STATE, OR FEDERAL REGULATIONS. THIS INCLUDES DUST CREATED BY WORK BEING PERFORMED ON THE SITE. AIR POLLUTION AND DUST CONTROL CORRECTION ARE CONSIDERED INCIDENTAL TO THE UNIT BID PRICES FOR WHICH WORK IS BEING PERFORMED. ADDITIONAL DUST CONTROL MEASURES MAY BE REQUIRED BY THE ENGINEER.

NO SANITARY AND SEPTIC WASTE IS ON THE SITE.

FINAL STABILIZATION:

THE CONTRACTOR MUST ENSURE FINAL STABILIZATION OF THE SITE. FINAL STABILIZATION IS ACHIEVED WHEN ALL SOIL DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED AND ALL SOILS ARE STABILIZED BY A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF 70 PERCENT OF THE PVIOUS SURFACE AREA, OR OTHER EQUIVALENT MEANS NECESSARY TO PREVENT SOIL FAILURE UNDER EROSION CONDITIONS.

ALL TEMPORARY EROSION PROTECTION, INCLUDING SILT FENCE, ARE TO BE REMOVED AFTER FINAL STABILIZATION OF THE SITE.

RECORDS RETENTION:

ALL REQUIREMENTS OF THE NPDES PERMIT AND THIS SWPPP SHALL REMAIN IN EFFECT UNTIL ALL LAND DISTURBING ACTIVITY HAS BEEN COMPLETED, ALL FINAL RESTORATION HAS BEEN COMPLETED AND THE NOTICE OF TERMINATION FORM HAS BEEN

SUBMITTED TO THE MINNESOTA POLLUTION CONTROL AGENCY (MPCA).

REFER TO OTHER SHEETS OF THIS PLAN SET FOR DETAILED CONSTRUCTION INFORMATION. EXISTING AND PROPOSED GRADES FOR THE ROADWAY ARE SHOWN ON THE PLAN AND PROFILE SHEETS AND ON THE CROSS SECTION SHEETS.

THE CONTRACTOR SHALL MAINTAIN A COPY OF THE PLANS ONSITE AT ALL TIMES UNTIL THE PROJECT HAS BEEN ACCEPTED BY THE CITY. THE CONTRACTOR SHALL UPDATE THE SWPPP AS NECESSARY TO REFLECT CURRENT CONDITIONS ON THE SITE. CONTRACTOR IS TO PROVIDE THE ENGINEER A COPY OF THE REVISED SWPPP. THE REVISED SWPPP IS TO BE MAINTAINED WITH THE CONSTRUCTION SET OF PLANS.

THE CONSTRUCTION PLANS, INCLUDING THE SWPPP, AND THE SWPPP INSPECTION REPORTS ARE TO BE AVAILABLE TO THE ENGINEER AND TO THE MPCA AND COON CREEK WATERSHED DISTRICT INSPECTORS AT ALL TIMES.

THE CONTRACTOR IS TO PROVIDE THE ENGINEER A COPY OF THE SWPPP INSPECTION REPORTS WITHIN SEVEN (7) DAYS AFTER THE INSPECTION.

THE CONTRACTOR IS TO PROVIDE THE ENGINEER A COPY OF THE REVISED SWPPP WITHIN SEVEN (7) DAYS AFTER THE CONTRACTOR REVISES THE SWPPP.

ALL SWPPP INSPECTIONS AND ALL BMPS SHALL BE PLACED UNDER THE SUPERVISION OF A CONSTRUCTION INSTALLER CERTIFIED BY THE MPCA. THE CONSTRUCTION SITE SHALL BE MANAGED AND MAINTAINED BY A MPCA CERTIFIED CONSTRUCTION SITE MANAGEMENT.

THE CONTRACTOR SHALL PROVIDE THE CITY WITH A COPY OF CONSTRUCTION INSTALLER CERTIFICATION AND CONSTRUCTION SITE MANAGEMENT CERTIFICATION. A COPY OF THE CERTIFICATIONS, INCLUDING SWPPP DESIGNER, SHALL BE KEPT WITH THE SWPPP.

THE SWPPP, THE SWPPP INSPECTIONS REPORTS AND MAINTENANCE RECORDS SHALL BE KEPT FOR 3 YEARS.

DRAINAGE CALCULATIONS AND DRAINAGE MAPS WILL BE KEPT BY THE CITY FOR AT LEAST 3 YEARS.

SEQUENCE OF EROSION CONTROL

1. OBTAIN ALL NECESSARY PERMITS, INCLUDING NPDES GENERAL STORMWATER PERMIT.
2. PLACE ALL PERIMETER SEDIMENT CONTROL DEVICES. TEMPORARY SEDIMENTATION BASINS, SILT FLotation CURTAINS, AND ROCK CONSTRUCTION EXITS.
3. CONTACT CITY ENGINEER FOR APPROVAL OF SEDIMENT CONTROL DEVICES.
4. ROUGH IN GRADE.
5. PLACE TEMPORARY EROSION CONTROL DEVICES AS NECESSARY.
6. PLACE STORM DRAIN SYSTEM.
7. RE-ADJUST TEMPORARY EROSION CONTROL DEVICES AS NECESSARY. PLACE STORM DRAIN INLET PROTECTION AND OUTLET PROTECTION DEVICES AS NECESSARY.
8. PLACE SITE PAVEMENT.
9. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, OBTAIN APPROVAL OF CITY ENGINEER.
10. CONTRACTOR TO REMOVE ALL TEMPORARY EROSION CONTROL DEVICES AFTER ACCEPTANCE BY THE CITY.

TABULATION SUMMARY

| ITEM                                | UNIT | TOTAL |
|-------------------------------------|------|-------|
| SILT FENCE                          | L.F. | 5,039 |
| EROSION CONTROL LOG                 | L.F. | 263   |
| CULVERT END CONTROLS                | EACH | 6     |
| EROSION CONTROL BLANKET             | S.Y. | 423.9 |
| CATCH BASIN INLET PROTECTION        | EACH | 36    |
| CLASS II RIPRAP W/ FABRIC           | C.Y. | 18.7  |
| GEOTEXTILE FILTER FABRIC            | S.Y. | 92.8  |
| HYDROMULCH TYPE 6                   | ACRE | 2.47  |
| TURF ESTABLISHMENT: SEED MIX 25-151 | ACRE | 2.34  |
| TURF ESTABLISHMENT: SEED MIX 34-181 | ACRE | 0.13  |

I HEREBY CERTIFY THAT THIS SWPPP WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY CERTIFIED SWPPP DESIGNER.

05/06/2021

DATE

David A. Krugler



800-252-1166 651-454-0002

UTILITIES: CENTURYLINK (763) 712-5017  
CENTERPOINT ENERGY (763) 323-2760  
COMCAST (952) 607-4078  
CONNEXUS ENERGY (763) 323-4268  
XCEL ENERGY (612) 526-4508

DATE REVISION HISTORY

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
*David A. Krugler*  
DATE 5/10/2021 REG. NO. 48768

RFC ENGINEERING, INC.  
Consulting Engineers

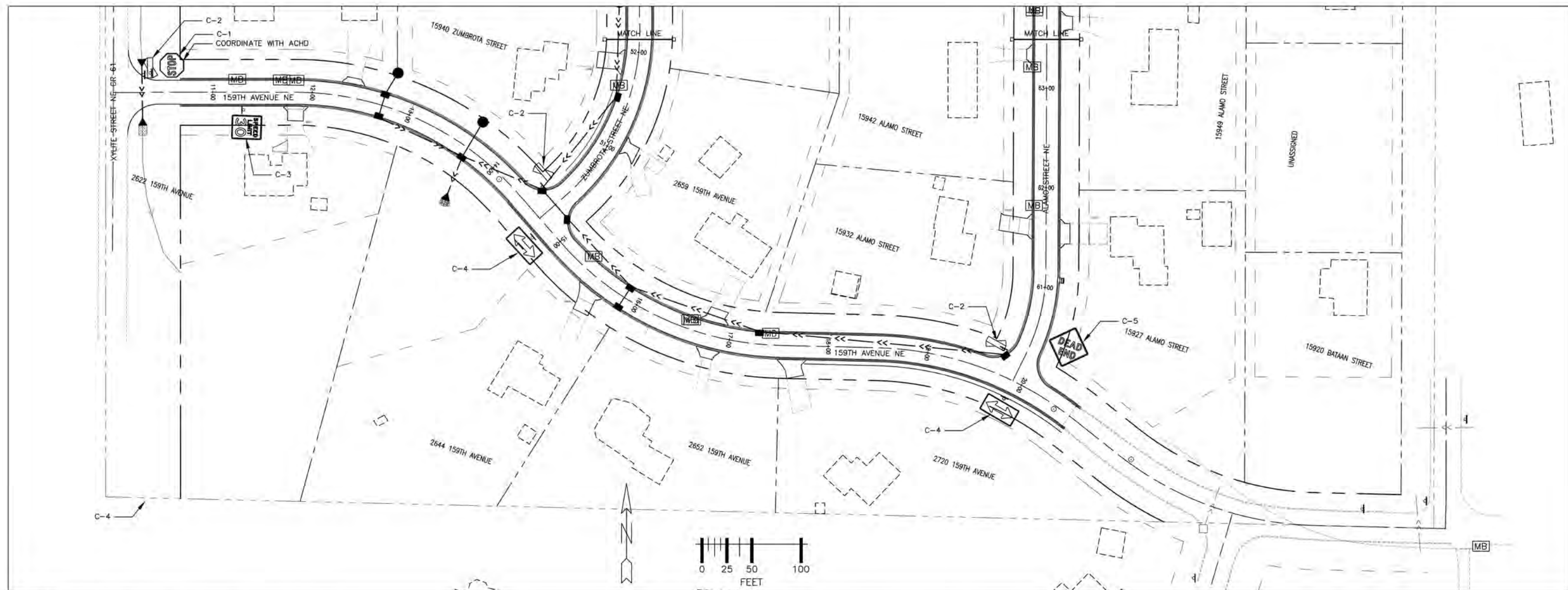
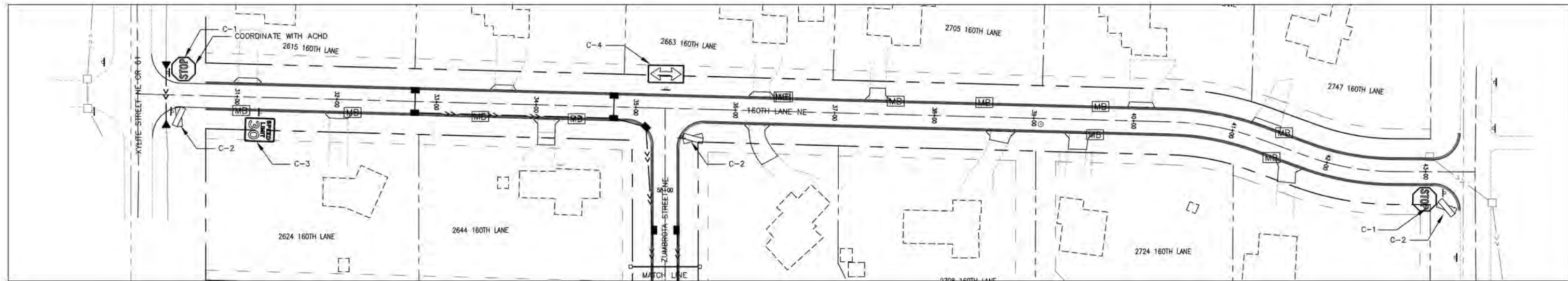
13635 Johnson Street  
Ham Lake, MN 55304  
Telephone 763-862-8000  
Fax 763-862-8042

HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS  
STORMWATER POLLUTION PREVENTION PLAN

DESIGN BY: GJM DRAWN BY: GJM CHECKED BY: TPC

DWG: 1907 SWPPP 3  
DATE: 05/06/21  
JOB NUMBER: 1907  
SHEET: 28 OF 44  
FILE: 35-1-157





NOTE:  
1. LOCATION OF SIGNS PER MNMUTCD SPECIFICATIONS.

**Gopher State  
ONE CALL**  
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XCEL ENERGY (612) 526-4508

| DATE | REVISION HISTORY |
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*Dave Krugler*  
DATE 5/10/2021 REG. NO. 48768

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Consulting Engineers

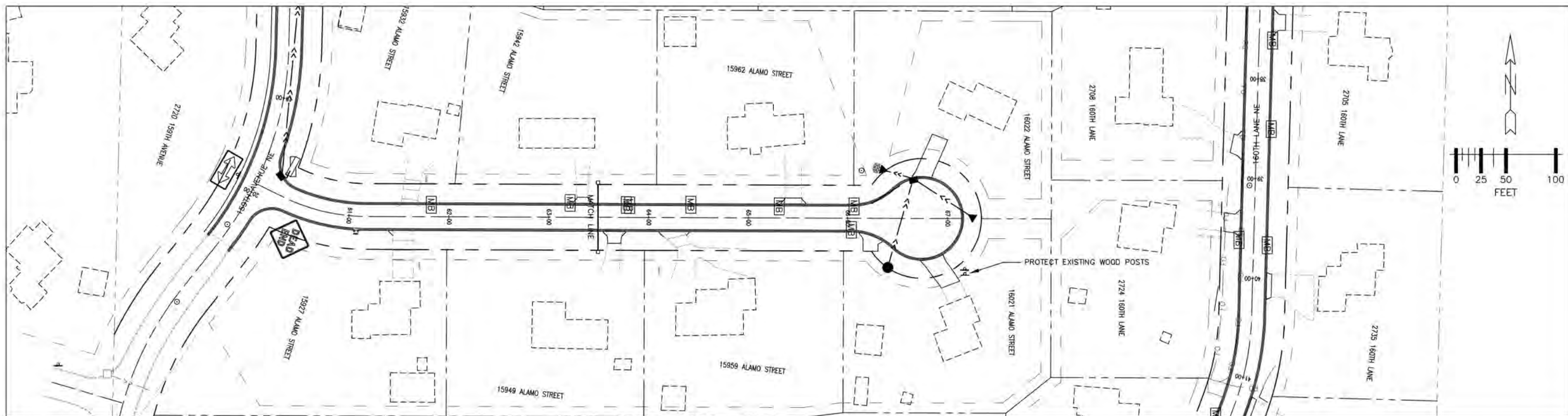
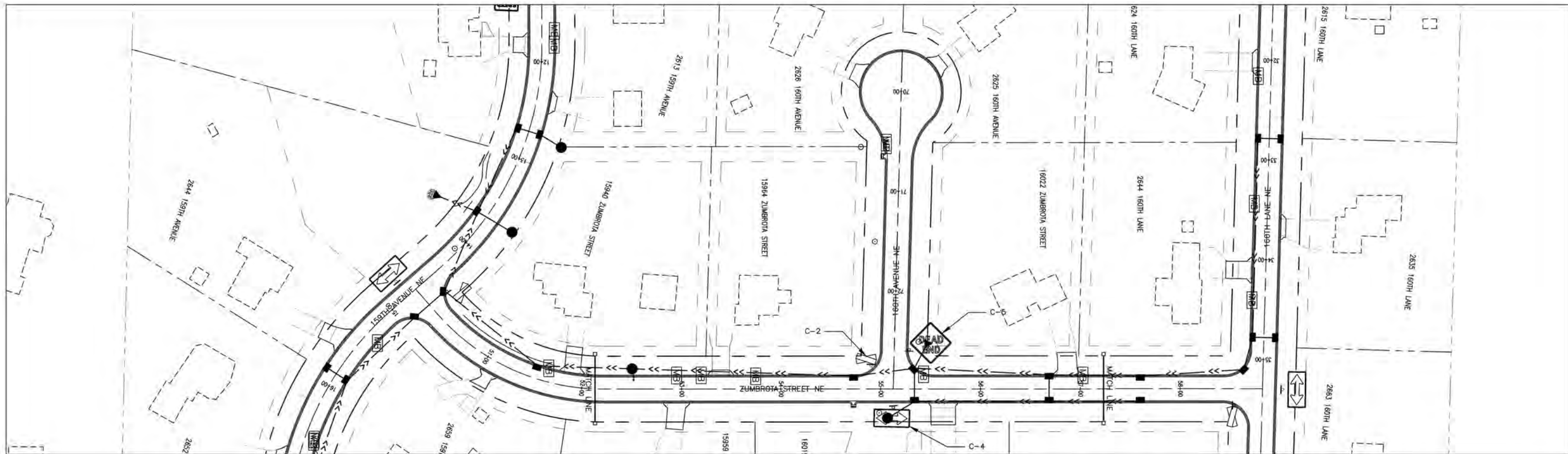
13635 Johnson Street  
Ham Lake, MN 55304  
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Fax 763-862-8042

HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

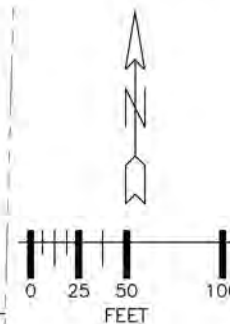
SIGNING PLAN

DESIGN BY: GJM DRAWN BY: GJM CHECKED BY: TPC

DWG: 1907 SIGN 1  
DATE: 05/06/21  
JOB NUMBER: 1907  
SHEET: 29 OF 44  
FILE: 35-1-158



NOTE:  
1. LOCATION OF SIGNS PER MNMUTCD SPECIFICATIONS.



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CENTERPOINT ENERGY (763) 323-2760  
COMCAST (952) 607-4078  
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XCEL ENERGY (612) 526-4508

DATE REVISION HISTORY

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DATE 5/10/2021 REG. NO. 48768

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Fax 763-862-8042

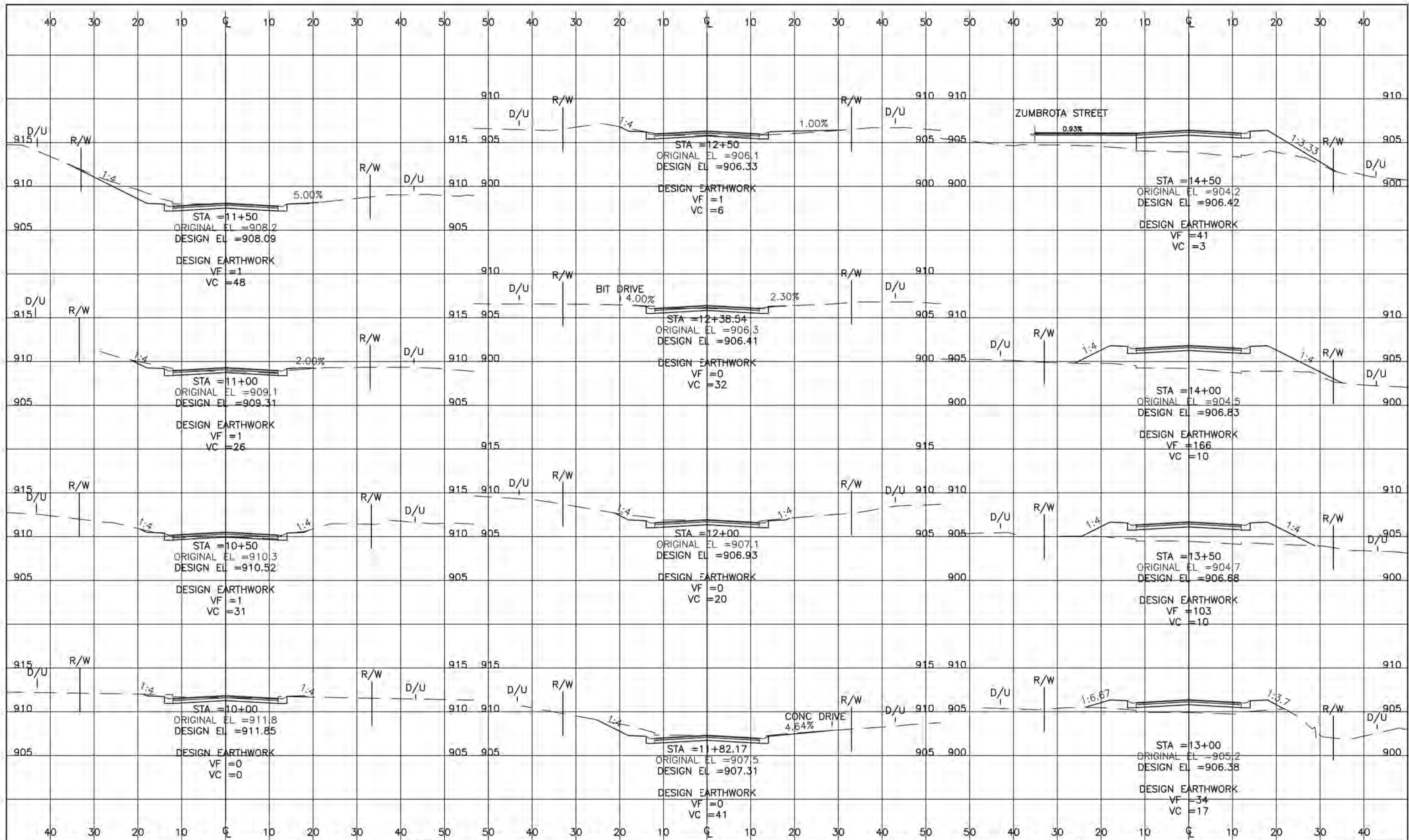
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LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

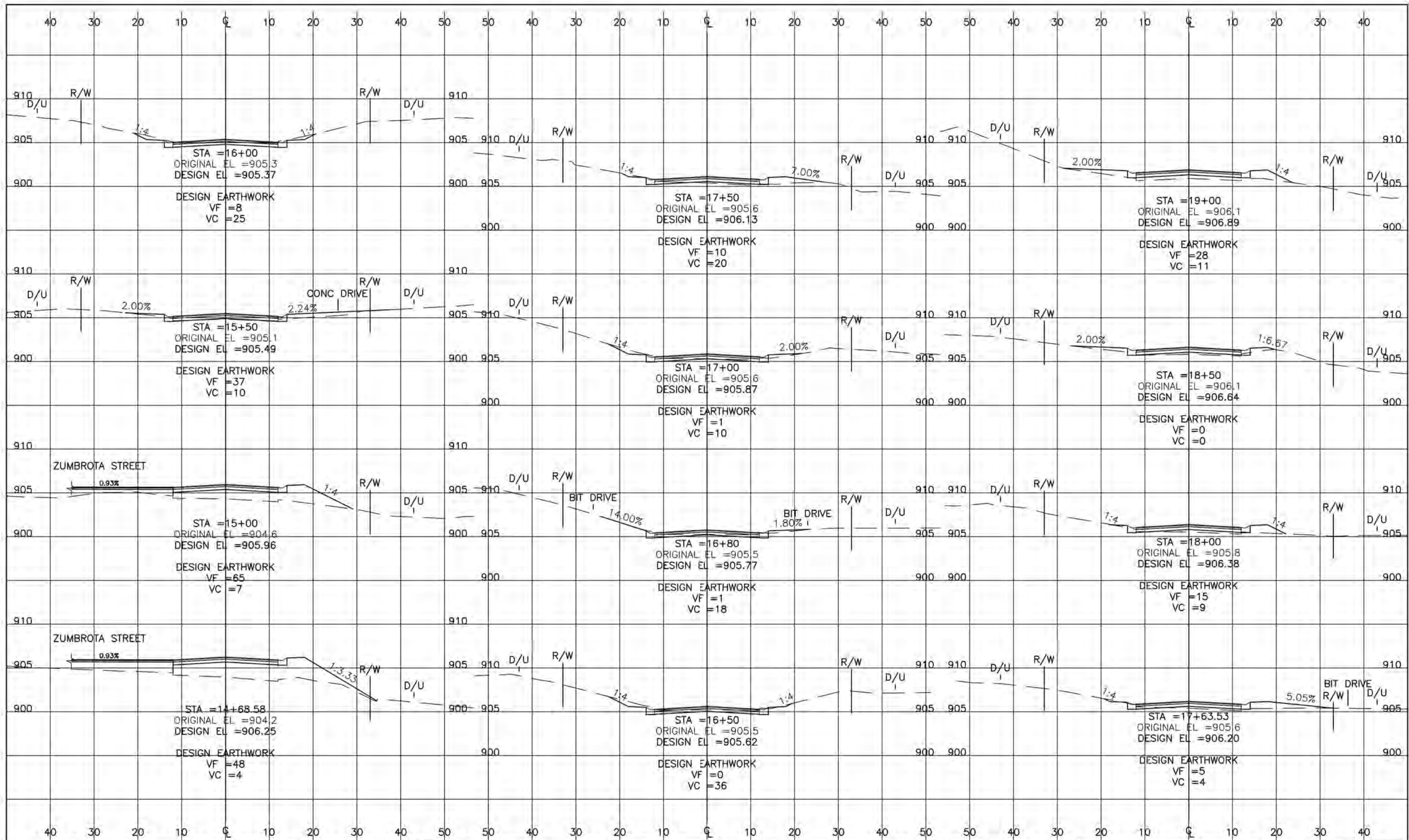
SIGNING PLAN

DESIGN BY: GJM DRAWN BY: GJM CHECKED BY: TPC

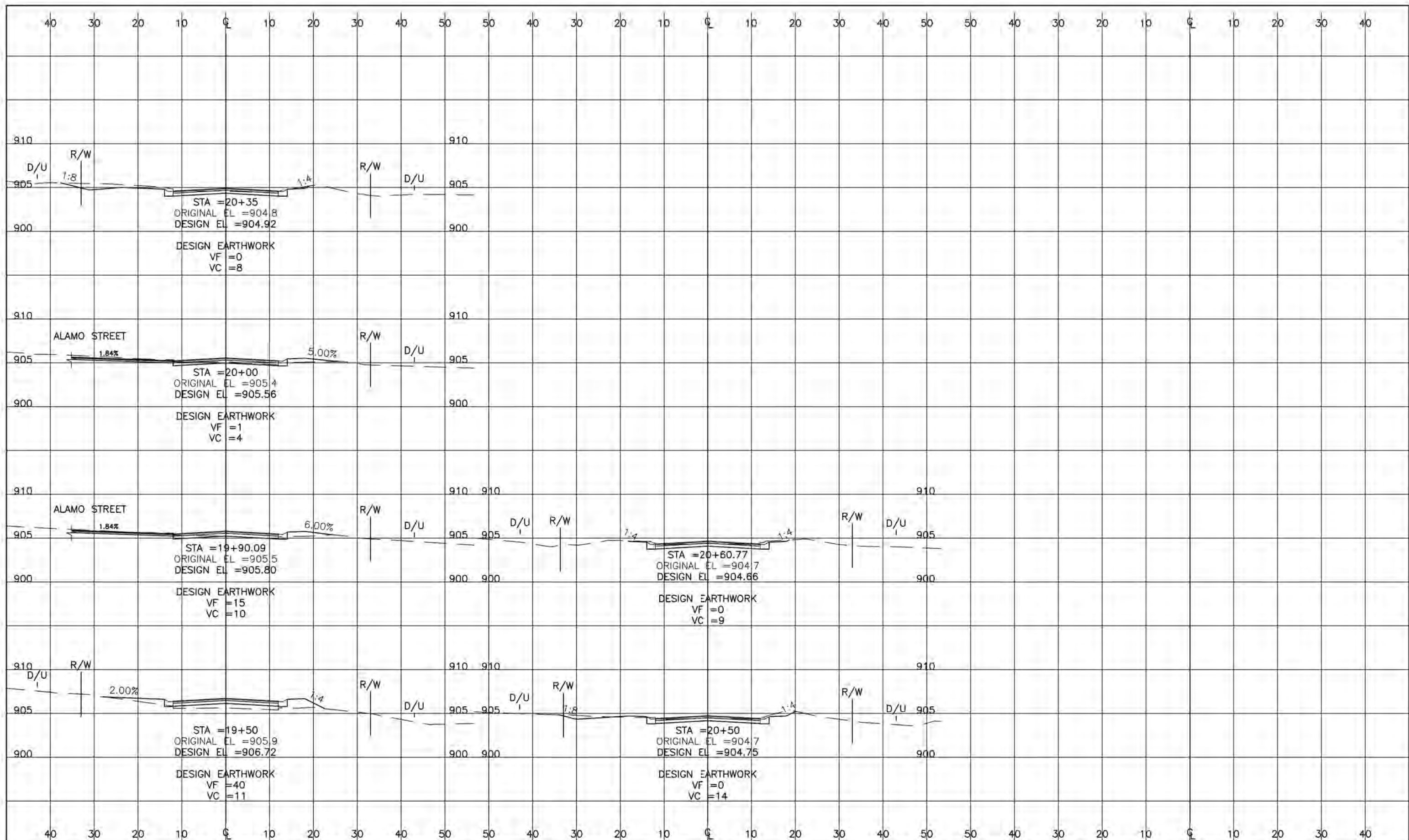
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DATE: 05/06/21  
JOB NUMBER: 1907  
SHEET: 30 OF 44  
FILE: 35-1-159













800-252-1166 651-454-0002

UTILITIES:

|                    |                |
|--------------------|----------------|
| CENTURYLINK        | (763) 712-5017 |
| CENTERPOINT ENERGY | (763) 323-2760 |
| COMCAST            | (952) 807-1078 |
| CONNEXUS ENERGY    | (763) 323-4268 |
| XCEL ENERGY        | (612) 526-4508 |

| DATE | REVISION HISTORY |
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*Dave Krugler*

DATE 5/10/2021 REG. NO. 48768

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Consulting Engineers

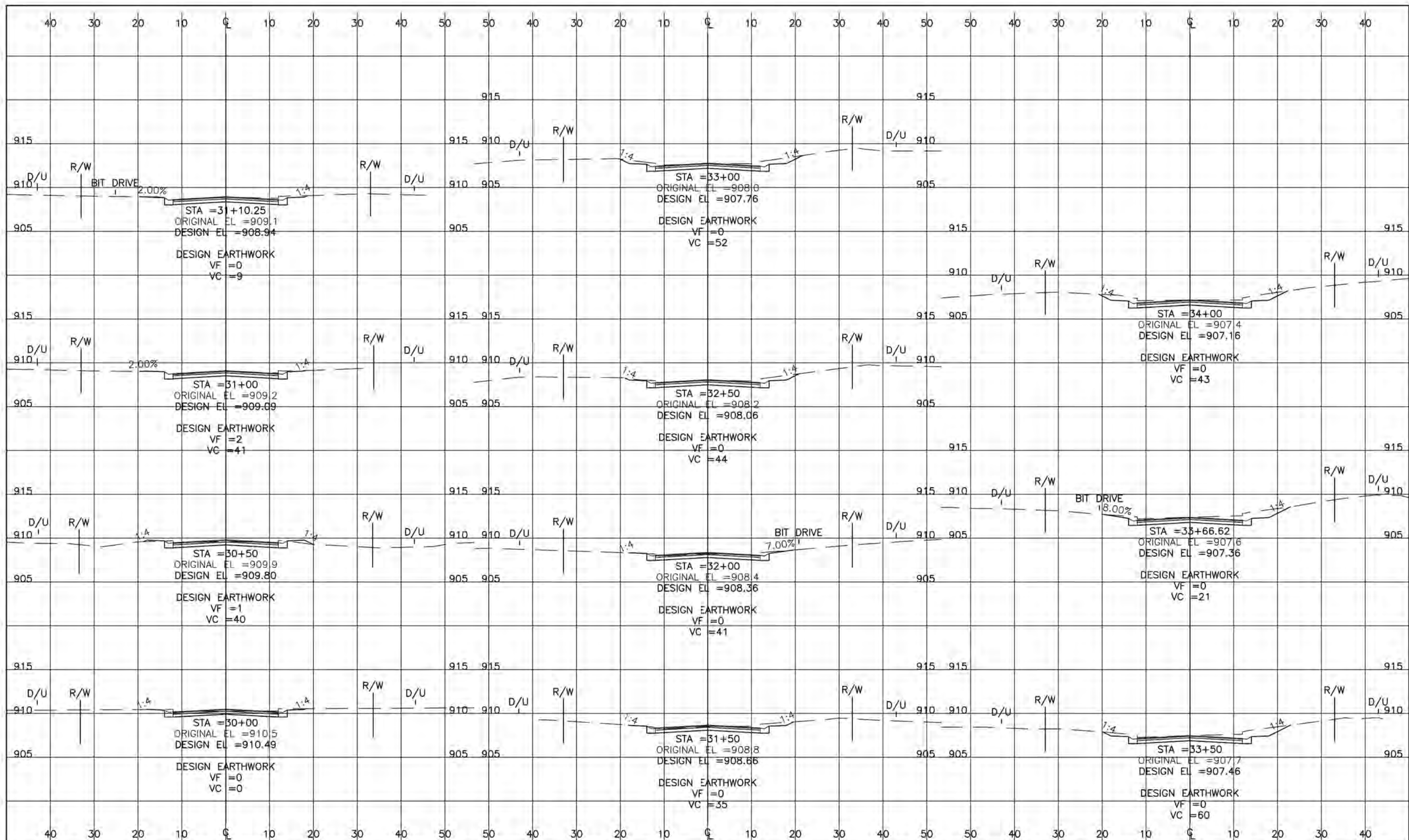
13635 Johnson Street  
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HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

159TH AVENUE CROSS SECTIONS

|             |          |
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| DWG:        | RC003001 |
| DATE:       | 05/06/21 |
| JOB NUMBER: | 1907     |
| SHEET:      | 33 OF 44 |
| FILE:       | 35-1-162 |

DESIGN BY: GJM    DRAWN BY: GJM    CHECKED BY: TPC





**Gopher State One Call**  
800-252-1166 651-454-0002  
PLOT DATE: 5/11/2021 13:15

UTILITIES: CENTURYLINK (763) 712-5017  
CENTERPOINT ENERGY (763) 323-2760  
COMCAST (952) 807-1078  
CONNEXUS ENERGY (763) 323-4268  
XCEL ENERGY (612) 526-4508

| DATE | REVISION HISTORY |
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*Dave Krugler*  
DATE 5/10/2021 REG. NO. 48768

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Consulting Engineers

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Ham Lake, MN 55304  
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Fax 763-862-8042

HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

160TH LANE CROSS SECTIONS

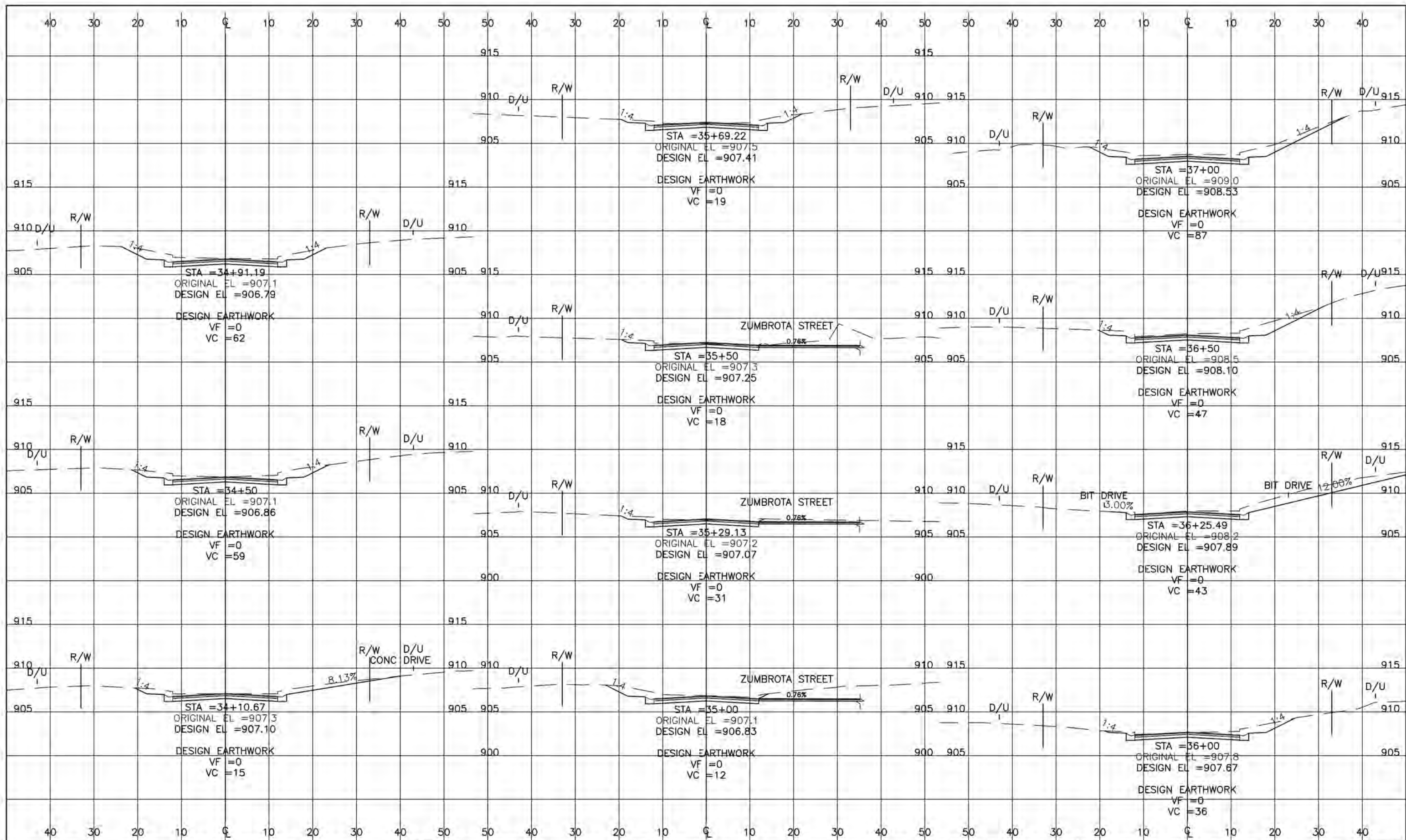
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| JOB NUMBER: 1907 |
| SHEET: 34 OF 44  |
| FILE: 35-1-163   |

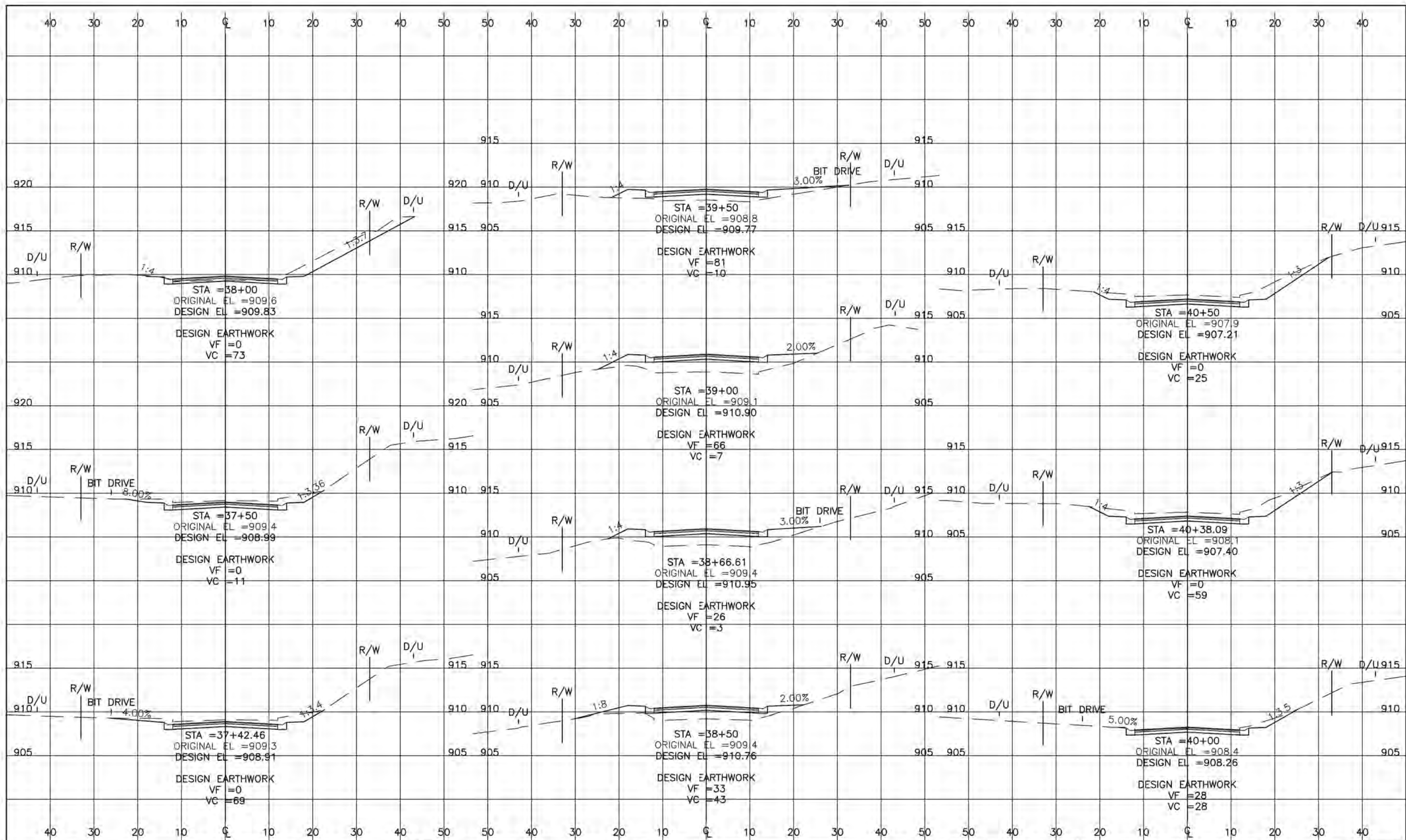
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DRAWN BY: GJM

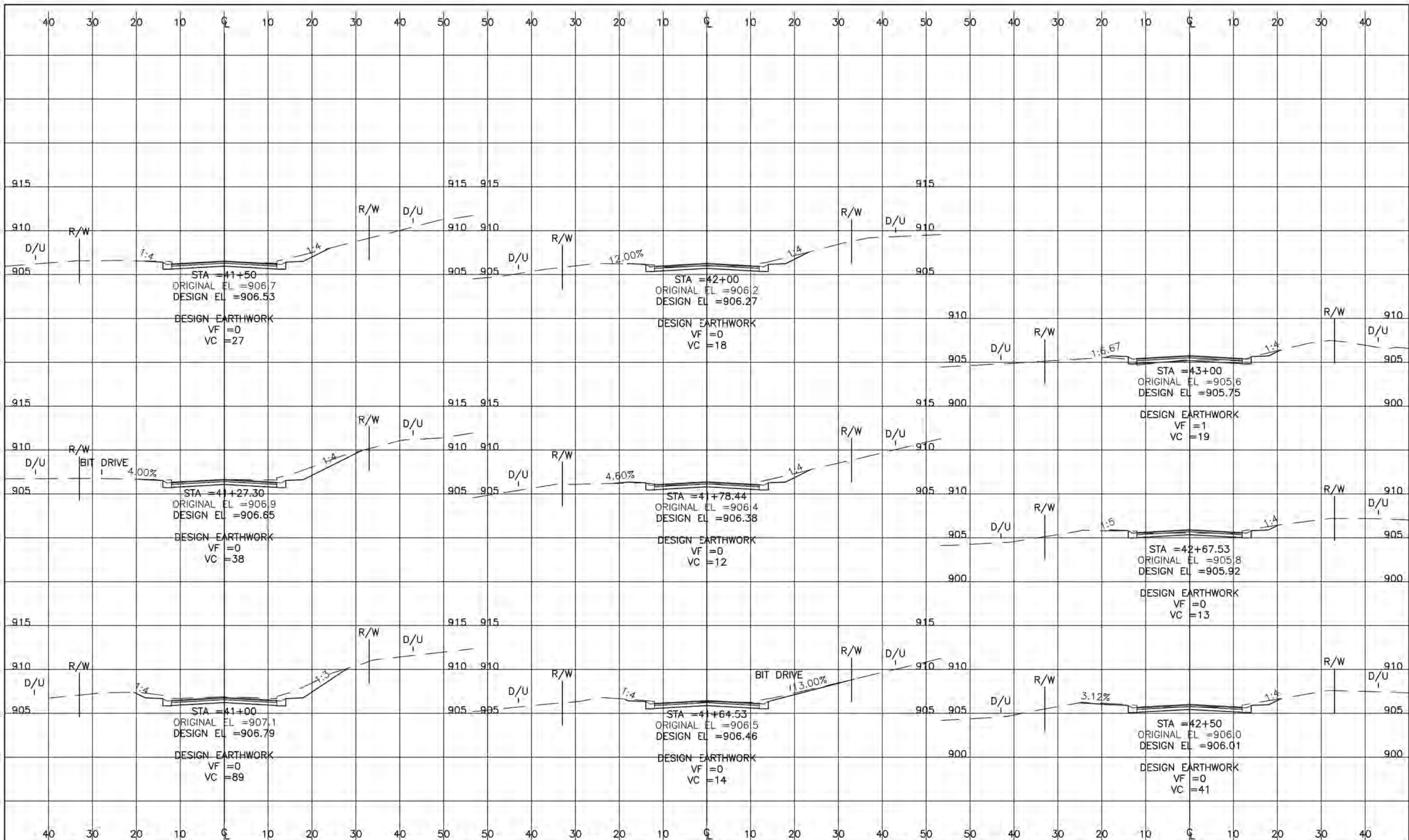
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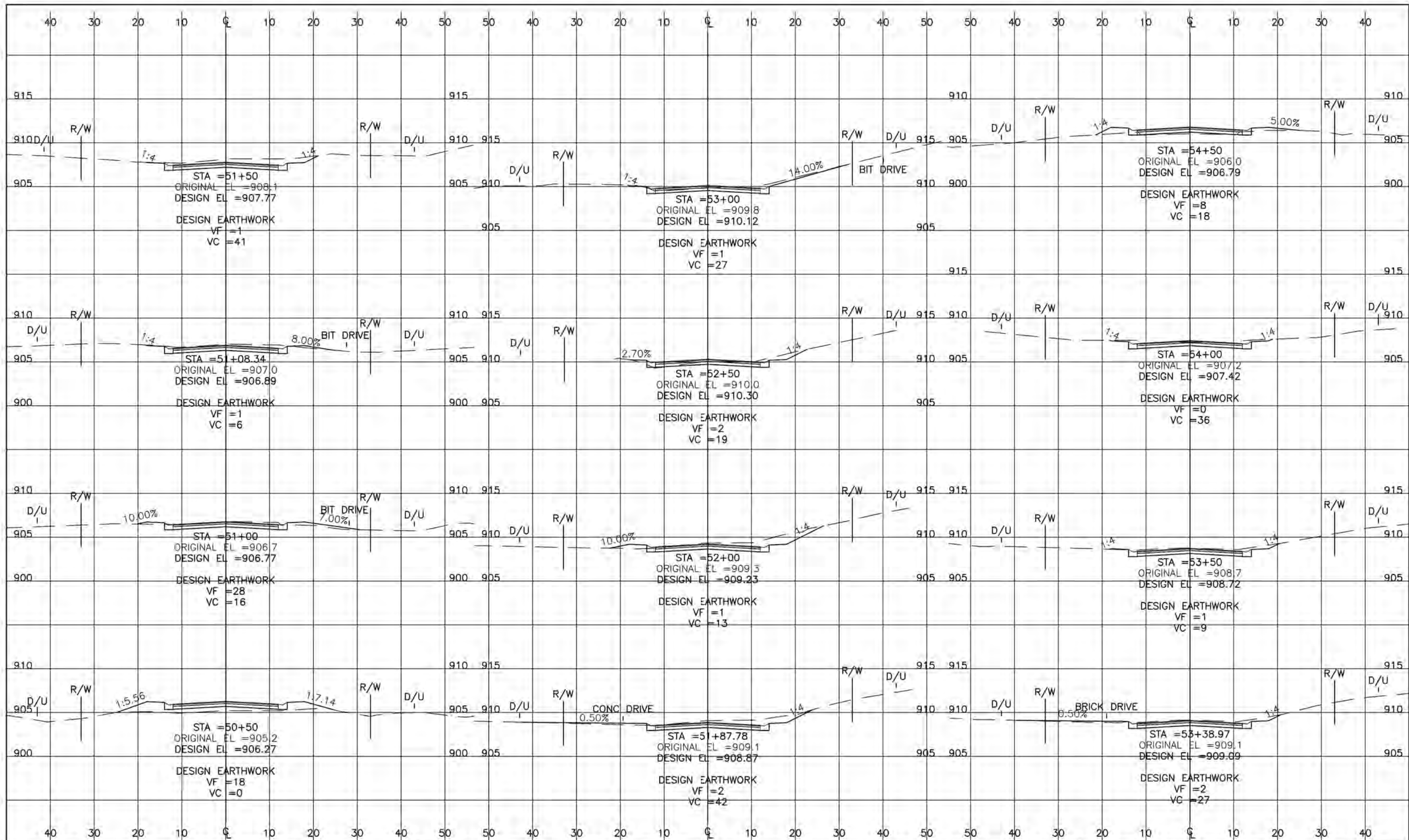




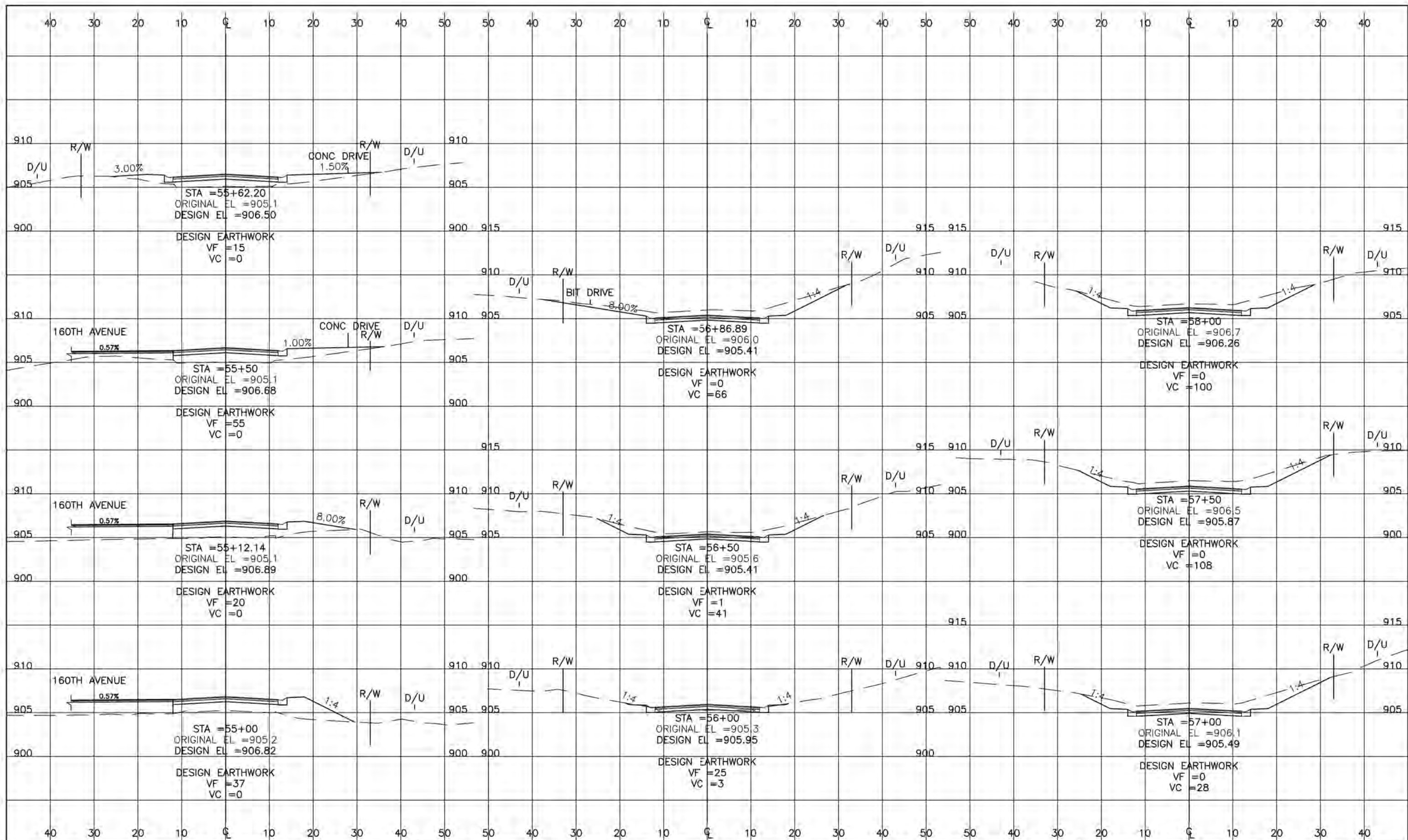


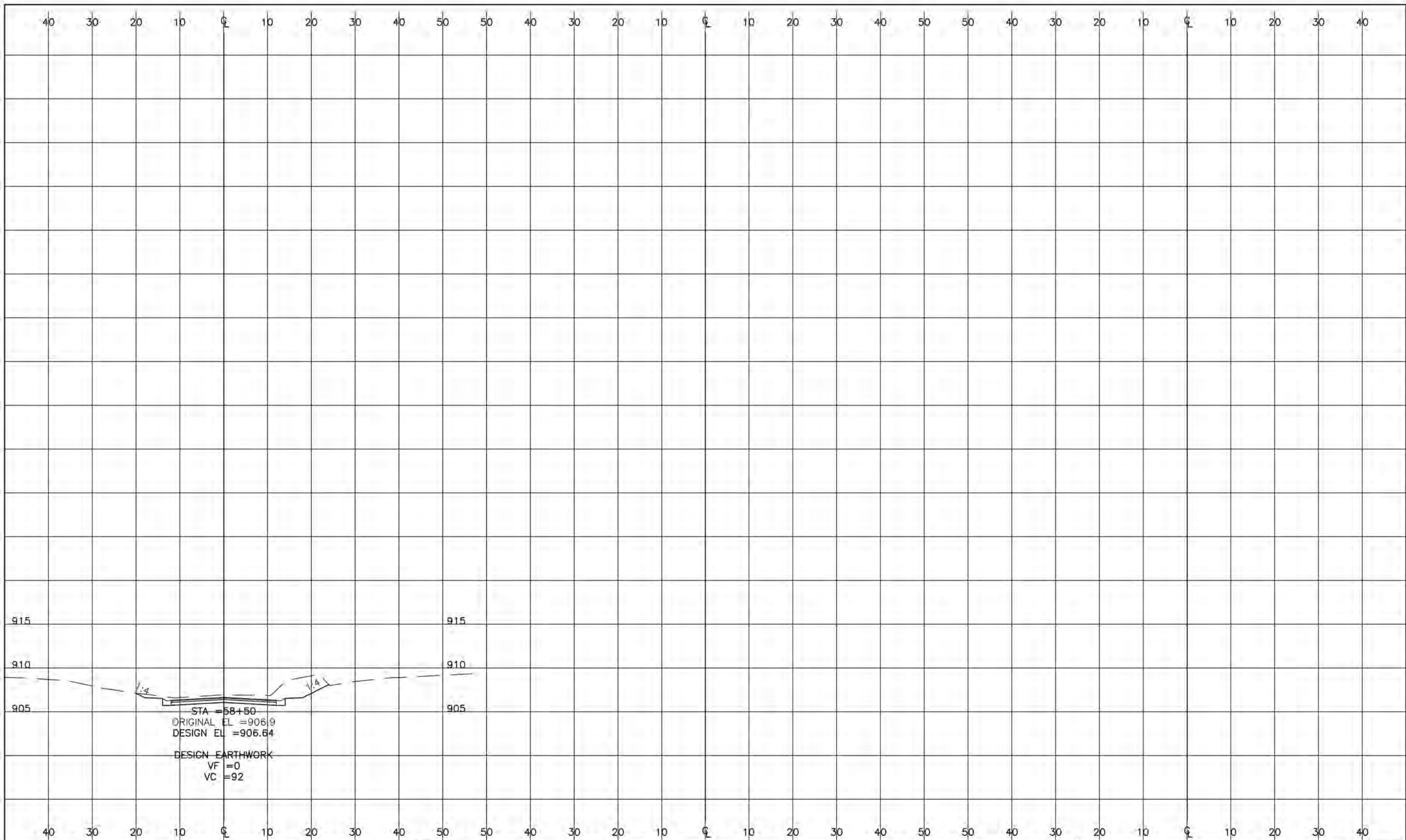














800-252-1166 651-454-0002  
PLOT DATE: 5/11/2021 13:15

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| CENTERPOINT ENERGY | (763) 323-2760 |
| COMCAST            | (952) 807-1078 |
| CONNEXIUS ENERGY   | (763) 323-4268 |
| XCEL ENERGY        | (612) 526-4508 |

| DATE | REVISION HISTORY |
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HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Dave Krugler*

DATE 5/10/2021 REG. NO. 48768

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HAM LAKE IMPROVEMENT PROJECT 1907  
LUND'S LAKEVIEW FOREST STREET RECONSTRUCTION  
159TH AVE NE, 160TH LN NE, AND OTHERS

ZUMBROTA STREET CROSS SECTIONS

|            |     |           |     |             |     |
|------------|-----|-----------|-----|-------------|-----|
| DESIGN BY: | GJM | DRAWN BY: | GJM | CHECKED BY: | TPC |
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| DWG:        | RC003003 |
| DATE:       | 05/06/21 |
| JOB NUMBER: | 1907     |
| SHEET:      | 40 OF 44 |
| FILE:       | 35-1-169 |



