

MINNESOTA DEPARTMENT OF TRANSPORTATION



RAMSEY COUNTY DEPARTMENT OF PUBLIC WORKS

PLAN FOR GRADING, BITUMINOUS SURFACING, ADA IMPROVEMENTS, RETAINING WALLS,
LIGHTING, SIGNALS, TMS, AND BRIDGE NO. 62735

LOCATED ON CSAH 53 (DALE STREET)
FROM: IGLEHART AVENUE TO: CSAH 34 (UNIVERSITY AVENUE)

S.P. 062-653-011

GROSS LENGTH 2267.54 FEET 0.429 MILES
BRIDGES-LENGTH 183.58 FEET 0.035 MILES
EXCEPTIONS-LENGTH FEET MILES
NET LENGTH 2267.54 FEET 0.429 MILES
REF. POINT 240+00.474

NOTE: LENGTH AND DESCRIPTION IS BASED ON DALE ST.
AND DALE ST. NB ALIGNMENTS.

END S.P. 062-653-011

DALE ST. NB STA. 35+24.37

AGREEMENT NO. 1035026
RAMSEY COUNTY
S.P. 6282-235 (TH 94 = 104)
STATE FUNDS
METRO DISTRICT

DATE: 9/5/2019 TIME: 10:33:52 AM FILENAME: K:\n-z\ramsey\04_1-Production\01_GAD\Highway\Sheets\cd062853011_1.txd.dgn

PLAN SYMBOLS

- STATE LINE
- COUNTY LINE
- TOWNSHIP OR RANGE LINE
- SECTION LINE
- QUARTER LINE
- SIXTEENTH LINE
- RIGHT-OF-WAY LINE
- TEMPORARY FASSETT
- PRESENT RIGHT-OF-WAY
- CONTROL OF ACCESS LINE
- PROPERTY LINES (EXCEPT LAND LINES)
- VACATED PLATTED PROPERTY
- CORPORATE OR CITY LIMITS
- TRUNK-HIGHWAY CENTER LINE
- RETAINING WALL
- RAILROAD
- RAILROAD RIGHT-OF-WAY
- RIVER OR CREEK
- DRY RUN
- DRAINAGE DITCH
- DRAIN TILE
- CULVERT
- DROP INLET
- GUARD RAIL
- BARBED WIRE FENCE
- WOODEN WIRE FENCE
- CHAIN LINK FENCE
- RAILROAD SNOW FENCE
- STONE WALL OR FENCE
- HEDGE
- RAILROAD CROSSING SIGN
- RAILROAD CROSSING BELL
- ELECTRIC WARNING SIGN
- CROSSING GATE
- WEATHER CORNER
- SPRINGS
- MARSH
- TIMBER
- ORCHARD
- BURSH
- NURSERY
- CATCH BASIN
- FIRE HYDRANT
- CATTLE GUARD
- OVERPASS (HIGHWAY OVER)
- UNDERPASS (HIGHWAY UNDER)
- BRIDGE
- BUILDING (ONE STORY FRAME)
- F - FRAME
- S - STONE
- B - BRICK
- CONCRETE
- TILE
- STUCCO
- IRON ROD OR PIPE
- MONUMENT (STONE, CONCRETE, OR METAL)
- WOODEN HUB
- GRAVEL PIT
- SAND PIT
- BORROW PIT
- ROCK QUARRY

UTILITY SYMBOLS

- POWER POLE LINE
- TELEPHONE POLE LINE
- ANCHOR
- STREET LIGHT
- STREET LIGHT CONDUIT
- PEDESTAL (TELEPHONE CABLE TERMINAL)
- GAS MAIN
- WATER MAIN
- HYDRANT
- VALVE
- TELEPHONE CABLE IN CONDUIT
- ELECTRIC CABLE IN CONDUIT
- TELEVISION CABLE IN CONDUIT
- TELEPHONE MANHOLE
- ELECTRIC MANHOLE
- BURIED TELEPHONE CABLE
- BURIED ELECTRIC CABLE
- BURIED TELEVISION CABLE
- TRAFFIC SIGNAL INTERCONNECT CABLE
- SEWER (STORM) MANHOLE
- SEWER (SANITARY) MANHOLE
- SEWER (STORM)
- SEWER (SANITARY)

SCALES

| | |
|-----------|-------|
| PLAN | 25' |
| PROFILE | 25' |
| INDEX MAP | 1000' |

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

CSAH 53 (DALE STREET)
DESIGN DESIGNATION

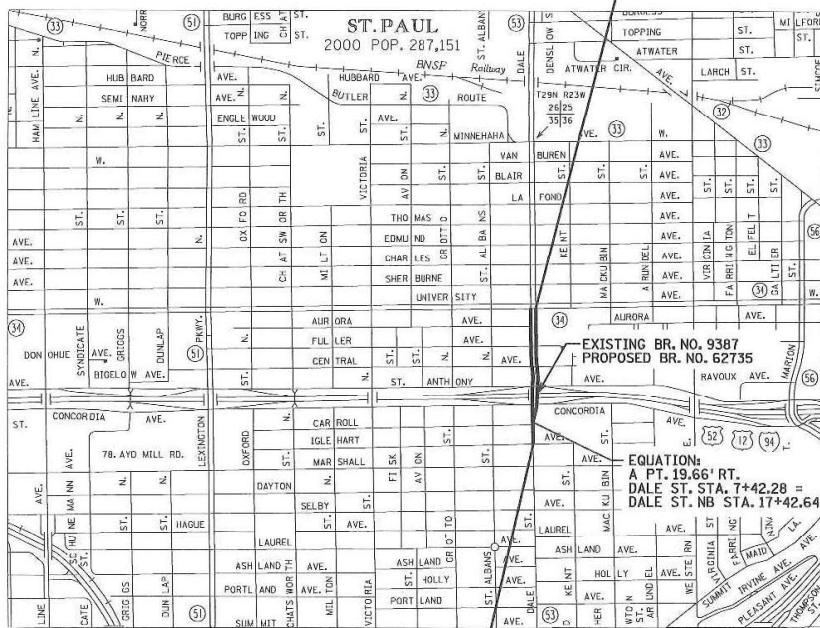
| | |
|---------------------|-------------------|
| ADT (2019) | 23,200 |
| ADT (2039) | 25,950 |
| FUNCTIONAL CLASS | A-MINOR AUGMENTOR |
| NO OF TRAFFIC LANES | 4 |
| NO OF PARKING LANES | 0 |
| SHOULDER WIDTH | 0 |
| R-VALUE | 50 |
| TON DESIGN | 10 |
| BESALS | 1,525,000 |
| DESIGN SPEED (MPH): | 30 |

BASED ON STOPPING SIGHT DISTANCE.
3.5 FT HEIGHT OF EYE
2.0 FT HEIGHT OF OBJECT

BEGIN S.P. 062-653-011
DALE ST. STA. 2+56.47

Ramsey County
Owned and Maintained
Storm Sewer and BMP

City of Saint Paul
Owned and Maintained
Storm Sewer



UTILITY NOTE:
THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CLASS 3B-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

TRAFFIC CONTROL NOTE:
ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO AND BE PLACED IN ACCORDANCE WITH THE LATEST EDITION OF THE "MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), INCLUDING "FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS".

STATE AID APPROVALS:
Catherine Huebner 9/4/19
DISTRICT STATE AID ENGINEER
POWERED FOR COMPLIANCE WITH STATE AID AND FEDERAL AID RULES/POLICY
Catherine Huebner 9/4/19
APPROVED FOR STATE AID AND FEDERAL AID FUNDING:
STATE AID ENGINEER

PROJECT LOCATION
STATE: MINNESOTA
COUNTY: RAMSEY
DIVISION: METRO
CITY: SAINT PAUL

FED. PROJ. NO. STPF 6219 (160)

GOVERNING SPECIFICATIONS

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

SHEET INDEX

| | |
|----------|---|
| 1 | TITLE SHEET |
| 2 | GENERAL LAYOUT |
| 3-7 | ESTIMATED QUANTITIES |
| 8 | SOILS & CONSTRUCTION NOTES |
| 9-27 | STANDARD PLATES |
| 28 | EARTHWORK TABULATIONS |
| 29-32 | QUANTITY TABULATIONS |
| 33-41 | INPLACE UTILITY TABULATIONS |
| 42-46 | TYPICAL SECTIONS |
| 47-84A | STANDARD PLANS |
| 85-98C | MISCELLANEOUS DETAILS |
| 99-100 | ALIGNMENT PLAN AND TABULATION |
| 101-105 | INPLACE TOPOGRAPHY, UTILITIES, AND REMOVALS |
| 106-110 | CONSTRUCTION PLANS |
| 111-119 | INTERSECTION AND SIDEWALK DETAILS |
| 120-125 | PROFILES |
| 126-128 | STORM WATER POLLUTION PREVENTION PLAN |
| 129-133 | DRAINAGE PLANS |
| 134-137 | DRAINAGE TABULATIONS AND PROFILES |
| 138-139B | DRAINAGE DETAILS |
| 140-144 | EROSION & SEDIMENT CONTROL PLANS |
| 145-149 | TURF ESTABLISHMENT PLANS |
| 150 | PREFABRICATED MODULAR BLOCK WALL PLAN AND PROFILE |
| 151-163 | RETAINING WALL B PLANS |
| 164-165 | WATERMAIN AND SANITARY SEWER PLANS |
| 166-221M | TRAFFIC CONTROL PLANS |
| 222-247A | SIGNING PLANS |
| 248-257 | PAVEMENT MARKING PLANS |
| 258-274 | LIGHTING PLANS |
| 275-300 | TRAFFIC SIGNAL PLANS |
| S21-S223 | TMS PLANS |
| X1-X16 | CROSS SECTIONS |

THIS PLAN CONTAINS 363 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.

TKDA
SIGNATURE: *Dawn Yastis*
PRINTED NAME: DAWN YASTIS
DATE: 9/5/2019 LIC. NO. 45469

APPROVED: *Paul J. Kest* 9-5-19
CITY OF SAINT PAUL ENGINEER

APPROVED: *Tom S. ...* 9/6/2019
RAMSEY COUNTY ENGINEER

RECOMMENDED FOR APPROVAL: *Mark ...* 9/11/2019
DISTRICT TRANSPORTATION ENGINEER

RECOMMENDED FOR APPROVAL: *S. Van ...* 9/11/2019
DISTRICT MATERIALS ENGINEER

RECOMMENDED FOR APPROVAL: *Bill ...* 9-11-2019
DISTRICT WATER RESOURCES/HYDRAULICS ENGINEER

RECOMMENDED FOR APPROVAL: *Stacy ...* 9/11/2019
DISTRICT ENGINEER

RECOMMENDED FOR APPROVAL: *J. ...* 11/1/2019
ATTY PRE-LETTING ENGINEER

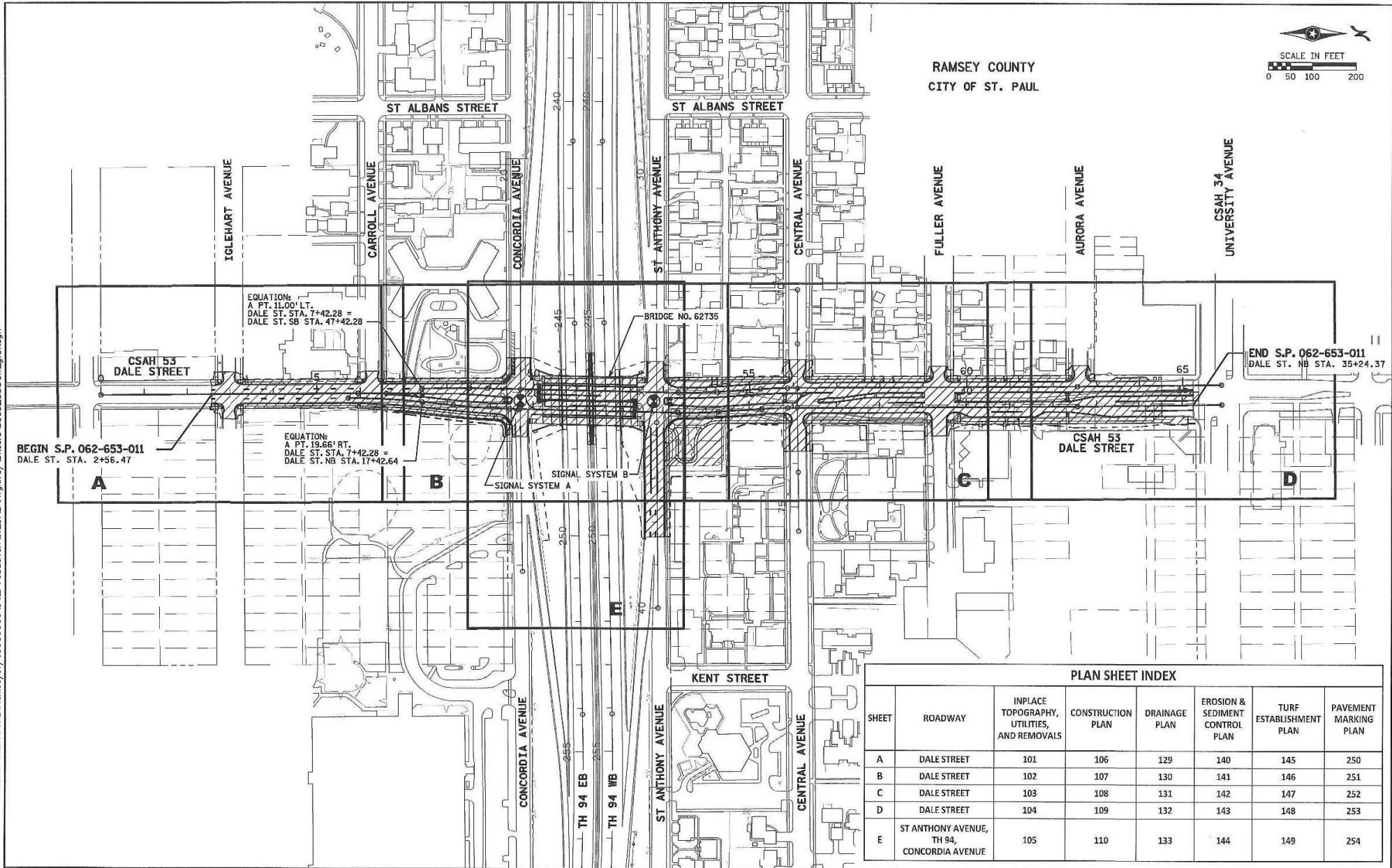
OFFICE OF LAND MANAGEMENT APPROVAL: *...* 11/1/2019
DIRECTOR, LAND MANAGEMENT

APPROVED: 11/4/2019
STATE DESIGN ENGINEER

S.P. 164-020-145, S.P. 062-653-011
S.P. 6282-235 (TH 94 = 104)

Sheet No. 1 of 300 Sheets

DATE: 9/16/2019 TIME: 2:05:12 PM
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RAMSEY COUNTY
 CITY OF ST. PAUL



BEGIN S.P. 062-653-011
 DALE ST. STA. 2+56.47

EQUATION:
 A PT. 11.00° LT.
 DALE ST. STA. 7+42.28 =
 DALE ST. SB STA. 47+42.28

EQUATION:
 A PT. 19.66° RT.
 DALE ST. STA. 7+42.28 =
 DALE ST. NB STA. 17+42.64

BRIDGE NO. 62735

END S.P. 062-653-011
 DALE ST. NB STA. 35+24.37

PLAN SHEET INDEX

| SHEET | ROADWAY | INPLACE TOPOGRAPHY, UTILITIES, AND REMOVALS | CONSTRUCTION PLAN | DRAINAGE PLAN | EROSION & SEDIMENT CONTROL PLAN | TURF ESTABLISHMENT PLAN | PAVEMENT MARKING PLAN |
|-------|--|---|-------------------|---------------|---------------------------------|-------------------------|-----------------------|
| A | DALE STREET | 101 | 106 | 129 | 140 | 145 | 250 |
| B | DALE STREET | 102 | 107 | 130 | 141 | 146 | 251 |
| C | DALE STREET | 103 | 108 | 131 | 142 | 147 | 252 |
| D | DALE STREET | 104 | 109 | 132 | 143 | 148 | 253 |
| E | ST ANTHONY AVENUE, TH 94, CONCORDIA AVENUE | 105 | 110 | 133 | 144 | 149 | 254 |

| NO. | DATE | BY | DESCRIPTION OF REVISIONS |
|-----|------|----|--------------------------|
| | | | |

I HEREBY CERTIFY THAT THIS SHEET WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DAILY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
 SIGNATURE: *Darwin Yasis*
 PRINTED NAME: DARWIN YASIS
 DATE: 9/6/2019 LIC. NO. 45469

TKDA
 441 Cedar Street, Suite 1500
 Saint Paul, MN 55101
 651.202.4400
 6666.com

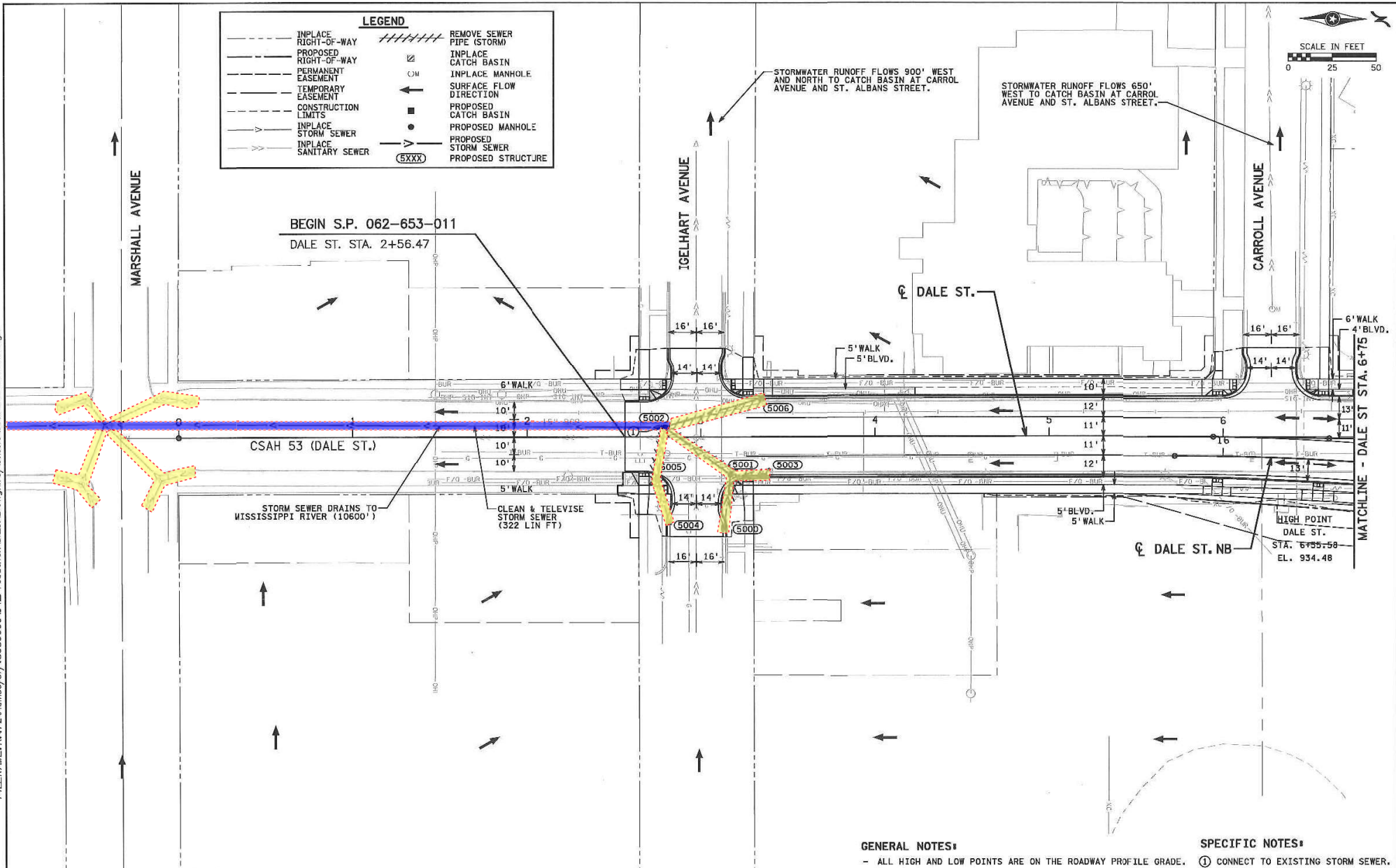
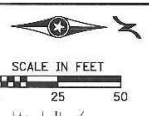
RAMSEY COUNTY
 DEPARTMENT OF
 PUBLIC WORKS
 DALE STREET

GENERAL LAYOUT

S.P. 6282-235 (TH94), 164-020-145, 062-653-011
 Sheet No. 2 of 300 Sheets

DATE: 10/28/2019 TIME: 11:47:54 AM
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| LEGEND | |
|-----------------------------|--------------------------------|
| --- INPLACE RIGHT-OF-WAY | //// REMOVE SEWER PIPE (STORM) |
| - - - PROPOSED RIGHT-OF-WAY | ▣ INPLACE CATCH BASIN |
| --- PERMANENT EASEMENT | ○ INPLACE MANHOLE |
| --- TEMPORARY EASEMENT | ← SURFACE FLOW DIRECTION |
| --- CONSTRUCTION LIMITS | ▣ PROPOSED CATCH BASIN |
| --- INPLACE STORM SEWER | ● PROPOSED MANHOLE |
| --- INPLACE SANITARY SEWER | --- PROPOSED STORM SEWER |
| | (5XXX) PROPOSED STRUCTURE |



GENERAL NOTES:
 - ALL HIGH AND LOW POINTS ARE ON THE ROADWAY PROFILE GRADE. ① CONNECT TO EXISTING STORM SEWER.

SPECIFIC NOTES:

| NO. | DATE | BY | DESCRIPTION OF REVISIONS |
|-----|------|----|--------------------------|
| | | | |

I HEREBY CERTIFY THAT THIS SHEET 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.
 SIGNATURE: *Matthew A. Wassman*
 PRINTED NAME: MATTHEW A. WASSMAN
 DATE: 10/28/2019 LIC. NO. 26883

444 Cedar Street, Suite 1500
 Saint Paul, MN 55101
 651.292.4400
 bnds.com

TKDA

RAMSEY COUNTY
 DEPARTMENT OF PUBLIC WORKS
 DALE STREET

DRAINAGE PLAN
 DALE ST. STA. 0+00 TO STA. 6+75

S.P. 6282-235 (TH94), 164-020-145, 062-653-011
 Sheet No. 129 of 300 Sheets

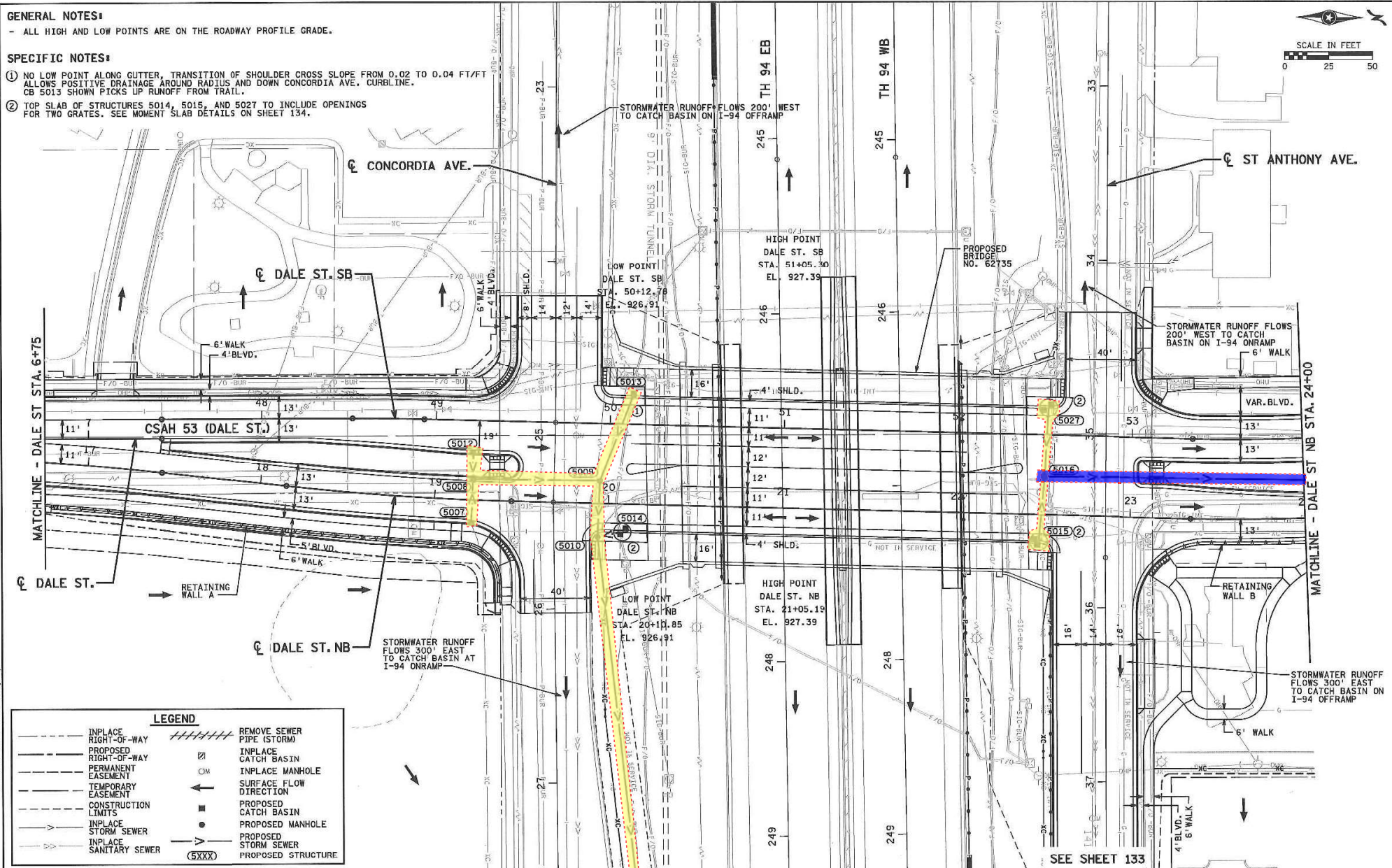
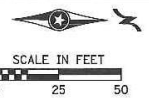
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GENERAL NOTES:

- ALL HIGH AND LOW POINTS ARE ON THE ROADWAY PROFILE GRADE.

SPECIFIC NOTES:

- ① NO LOW POINT ALONG GUTTER, TRANSITION OF SHOULDER CROSS SLOPE FROM 0.02 TO 0.04 FT/FT ALLOWS POSITIVE DRAINAGE AROUND RADIUS AND DOWN CONCORDIA AVE. CURBLINE. CB 5013 SHOWN PICKS UP RUNOFF FROM TRAIL.
- ② TOP SLAB OF STRUCTURES 5014, 5015, AND 5027 TO INCLUDE OPENINGS FOR TWO GRATES. SEE MOMENT SLAB DETAILS ON SHEET 134.



| LEGEND | |
|-----------------------------|--------------------------------|
| --- INPLACE RIGHT-OF-WAY | //// REMOVE SEWER PIPE (STORM) |
| - - - PROPOSED RIGHT-OF-WAY | ⊠ INPLACE CATCH BASIN |
| --- PERMANENT EASEMENT | ⊡ INPLACE MANHOLE |
| - - - TEMPORARY EASEMENT | → SURFACE FLOW DIRECTION |
| --- CONSTRUCTION LIMITS | ■ PROPOSED CATCH BASIN |
| --- INPLACE STORM SEWER | ● PROPOSED MANHOLE |
| --- INPLACE SANITARY SEWER | ○ PROPOSED STORM SEWER |
| | (SXXX) PROPOSED STRUCTURE |

| NO. | DATE | BY | DESCRIPTION OF REVISIONS |
|-----|------|----|--------------------------|
| | | | |

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 PRINTED NAME: MATTHEW A. WASSMAN
 DATE: 10/28/2019 LIC. NO. 26883

444 Cedar Street, Suite 1500
 Saint Paul, MN 55101
 651.292.4400
 info@tkda.com

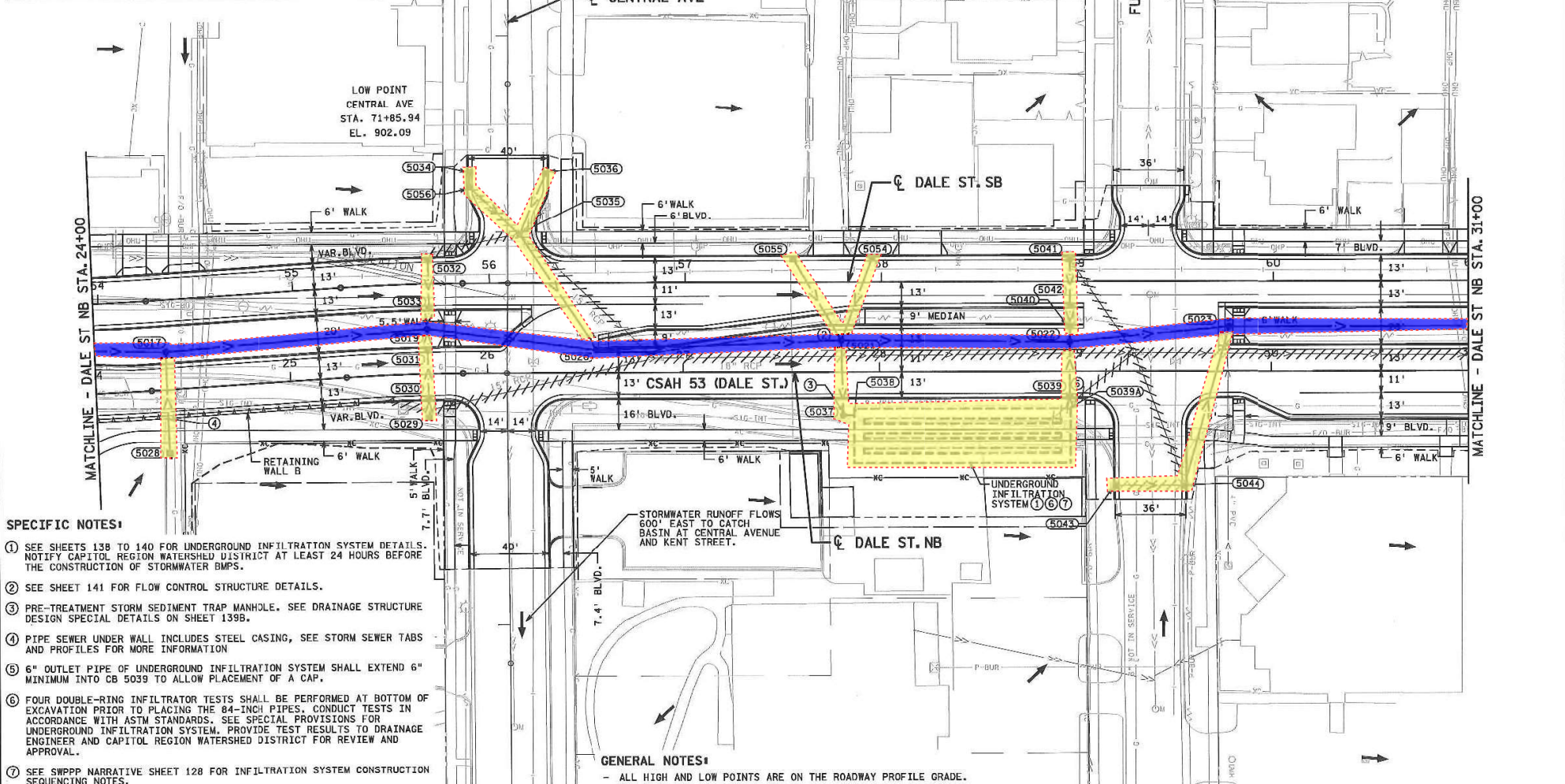
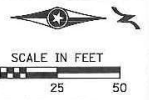
RAMSEY COUNTY
 DEPARTMENT OF PUBLIC WORKS
 DALE STREET

DRAINAGE PLAN
 DALE ST. STA. 6+75 TO STA. 7+42.28
 DALE ST. NB STA. 17+42.64 TO STA. 24+00

S.P. 6282-235 (TH94)164-020-145,062-653-011
 Sheet No. 130 of 300 Sheets

DATE: 10/28/2019 TIME: 11:47:57 AM
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| LEGEND | |
|------------------------|---------------------------|
| INPLACE RIGHT-OF-WAY | REMOVE SEWER PIPE (STORM) |
| PROPOSED RIGHT-OF-WAY | INPLACE CATCH BASIN |
| PERMANENT EASEMENT | INPLACE MANHOLE |
| TEMPORARY EASEMENT | SURFACE FLOW DIRECTION |
| CONSTRUCTION LIMITS | PROPOSED CATCH BASIN |
| INPLACE STORM SEWER | PROPOSED MANHOLE |
| INPLACE SANITARY SEWER | PROPOSED STORM SEWER |
| | PROPOSED STRUCTURE |



SPECIFIC NOTES:

- ① SEE SHEETS 138 TO 140 FOR UNDERGROUND INFILTRATION SYSTEM DETAILS. NOTIFY CAPITOL REGION WATERSHED DISTRICT AT LEAST 24 HOURS BEFORE THE CONSTRUCTION OF STORMWATER BMPs.
- ② SEE SHEET 141 FOR FLOW CONTROL STRUCTURE DETAILS.
- ③ PRE-TREATMENT STORM SEDIMENT TRAP MANHOLE. SEE DRAINAGE STRUCTURE DESIGN SPECIAL DETAILS ON SHEET 139B.
- ④ PIPE SEWER UNDER WALL INCLUDES STEEL CASING, SEE STORM SEWER TABS AND PROFILES FOR MORE INFORMATION
- ⑤ 6" OUTLET PIPE OF UNDERGROUND INFILTRATION SYSTEM SHALL EXTEND 6" MINIMUM INTO CB 5039 TO ALLOW PLACEMENT OF A CAP.
- ⑥ FOUR DOUBLE-RING INFILTRATOR TESTS SHALL BE PERFORMED AT BOTTOM OF EXCAVATION PRIOR TO PLACING THE 84-INCH PIPES. CONDUCT TESTS IN ACCORDANCE WITH ASTM STANDARDS. SEE SPECIAL PROVISIONS FOR UNDERGROUND INFILTRATION SYSTEM. PROVIDE TEST RESULTS TO DRAINAGE ENGINEER AND CAPITOL REGION WATERSHED DISTRICT FOR REVIEW AND APPROVAL.
- ⑦ SEE SWPPP NARRATIVE SHEET 128 FOR INFILTRATION SYSTEM CONSTRUCTION SEQUENCING NOTES.

GENERAL NOTES:

- ALL HIGH AND LOW POINTS ARE ON THE ROADWAY PROFILE GRADE.

| NO. | DATE | BY | DESCRIPTION OF REVISIONS |
|-----|------|----|--------------------------|
| | | | |

I HEREBY CERTIFY THAT THIS SHEET 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.

SIGNATURE: *Matthew A. Wassman*
 PRINTED NAME: MATTHEW A. WASSMAN
 DATE: 10/28/2019 LIC. NO. 26883

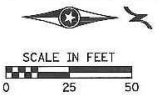
444 Cochrane Street, Suite 1500
 Saint Paul, MN 55111
 651.292.4400
 tkda.com

RAMSEY COUNTY
 DEPARTMENT OF
 PUBLIC WORKS
 DALE STREET

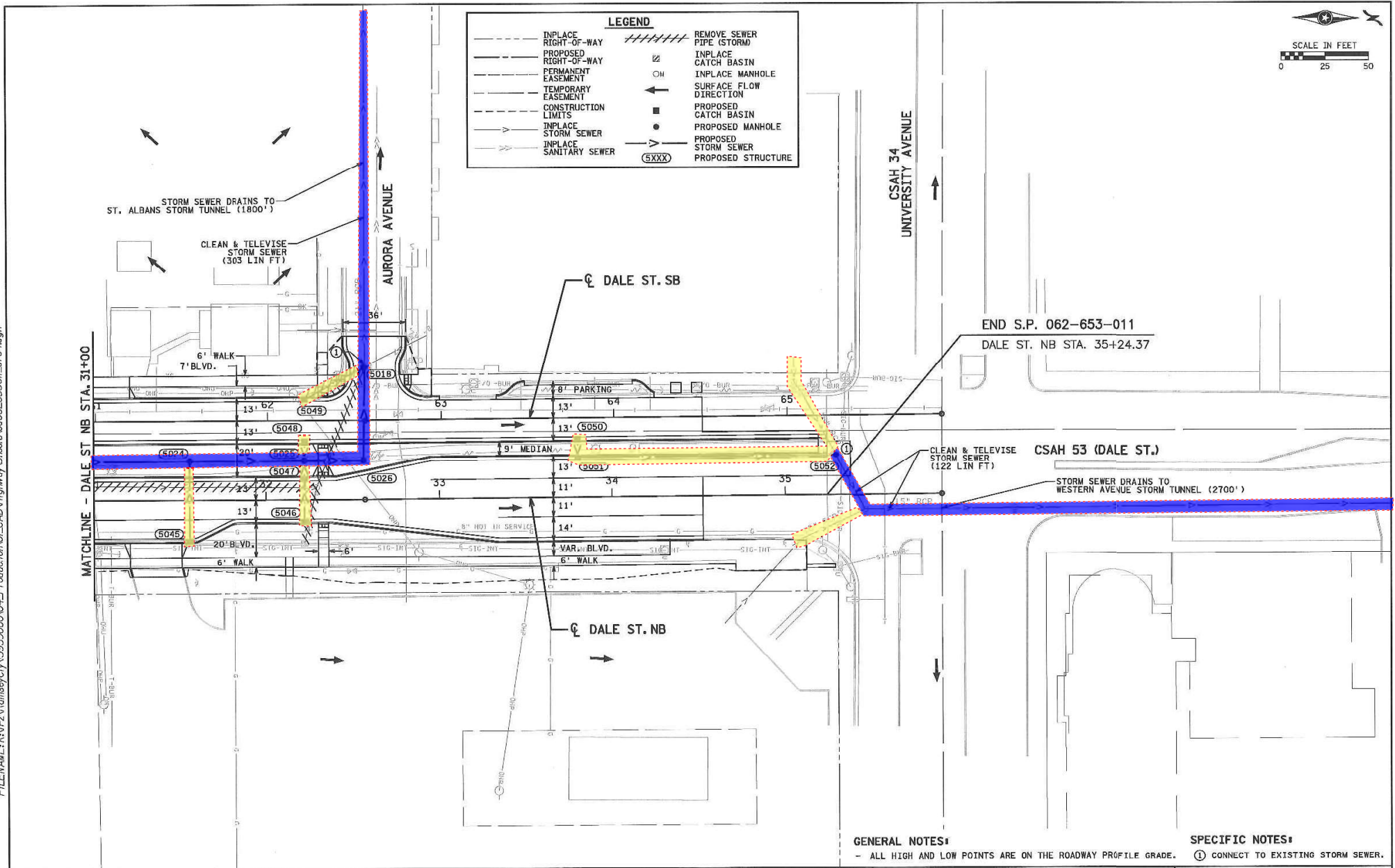
DRAINAGE PLAN
 DALE ST. NB STA. 24+00 TO STA. 31+00

S.P. 6282-235 (TH94)164-020-145,062-653-011
 Sheet No. 131 of 300 Sheets

DATE: 01/28/2019 TIME: 11:47:58 AM
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| LEGEND | |
|-----------------------------|--------------------------------|
| --- INPLACE RIGHT-OF-WAY | //// REMOVE SEWER PIPE (STORM) |
| - - - PROPOSED RIGHT-OF-WAY | □ INPLACE CATCH BASIN |
| --- PERMANENT EASEMENT | ○ INPLACE MANHOLE |
| --- TEMPORARY EASEMENT | ← SURFACE FLOW DIRECTION |
| --- CONSTRUCTION LIMITS | ■ PROPOSED CATCH BASIN |
| --- INPLACE STORM SEWER | ● PROPOSED MANHOLE |
| --- INPLACE SANITARY SEWER | ▽ PROPOSED STORM SEWER |
| | ⓧ PROPOSED STRUCTURE |



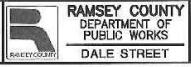
GENERAL NOTES:
 - ALL HIGH AND LOW POINTS ARE ON THE ROADWAY PROFILE GRADE.

SPECIFIC NOTES:
 ○ CONNECT TO EXISTING STORM SEWER.

| NO. | DATE | BY | DESCRIPTION OF REVISIONS |
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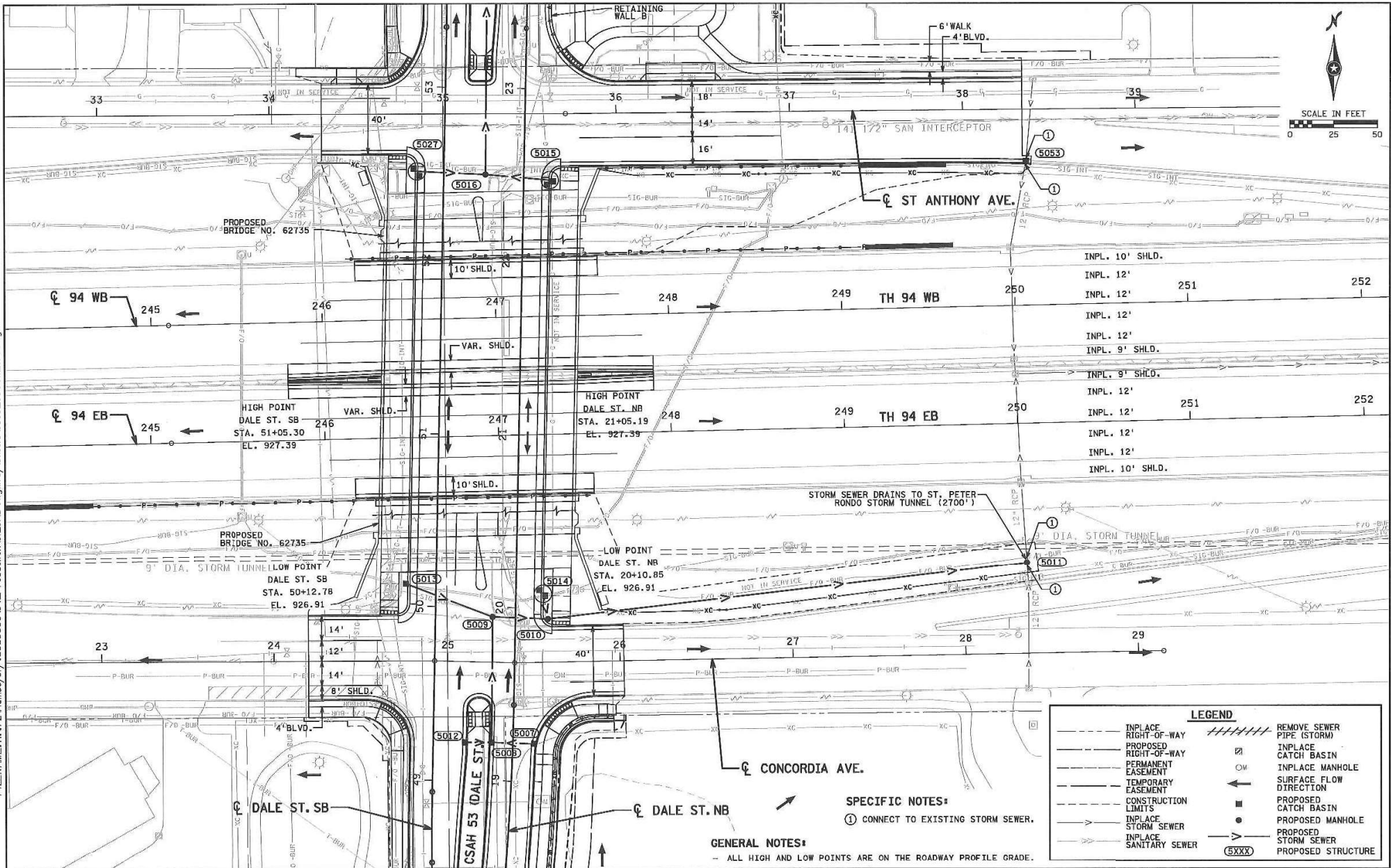
SIGNATURE: *Matthew A. Wassman*
 PRINTED NAME: MATTHEW A. WASSMAN
 DATE: 10/28/2019 LIC. NO. 26883



DRAINAGE PLAN
 DALE ST. NB STA. 31+00 TO STA. 35+24.37

S.P. 6282-235 (TH94),164-020-145,062-653-011
 Sheet No. 132 of 300 Sheets

DATE: 10/28/2019 TIME: 11:48:00 AM
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| LEGEND | |
|-----------------------------|---------------------------------|
| --- INPLACE RIGHT-OF-WAY | ##### REMOVE SEWER PIPE (STORM) |
| - - - PROPOSED RIGHT-OF-WAY | ◻ INPLACE CATCH BASIN |
| --- PERMANENT EASEMENT | ◻ INPLACE MANHOLE |
| - - - TEMPORARY EASEMENT | ← SURFACE FLOW DIRECTION |
| - - - CONSTRUCTION LIMITS | ■ PROPOSED CATCH BASIN |
| --- INPLACE STORM SEWER | ● PROPOSED MANHOLE |
| --- INPLACE SANITARY SEWER | ▽ PROPOSED STORM SEWER |
| | ⊞ PROPOSED STRUCTURE |

SPECIFIC NOTES:
 ① CONNECT TO EXISTING STORM SEWER.

GENERAL NOTES:
 - ALL HIGH AND LOW POINTS ARE ON THE ROADWAY PROFILE GRADE.

| NO. | DATE | BY | DESCRIPTION OF REVISIONS |
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I HEREBY CERTIFY THAT THIS SHEET 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.
 SIGNATURE: *Matthew A. Wassman*
 PRINTED NAME: MATTHEW A. WASSMAN
 DATE: 10/28/2019 LIC. NO. 26883

441 Cedar Street, Suite 1000
 Saint Paul, MN 55101
 651.292.4400
 info@tkda.com

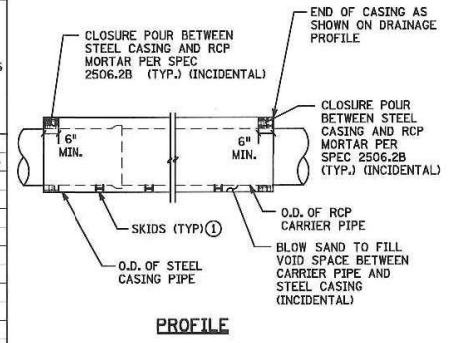
RAMSEY COUNTY
 DEPARTMENT OF PUBLIC WORKS
 DALE STREET

DRAINAGE PLAN
 ST ANTHONY AVENUE, TH 94,
 CONCORDIA AVENUE

S.P. 6282-235 (TH94), 164-020-145, 062-653-011
 Sheet No. 133 of 300 Sheets

DATE: 10/14/2019 TIME: 2:01:34 PM
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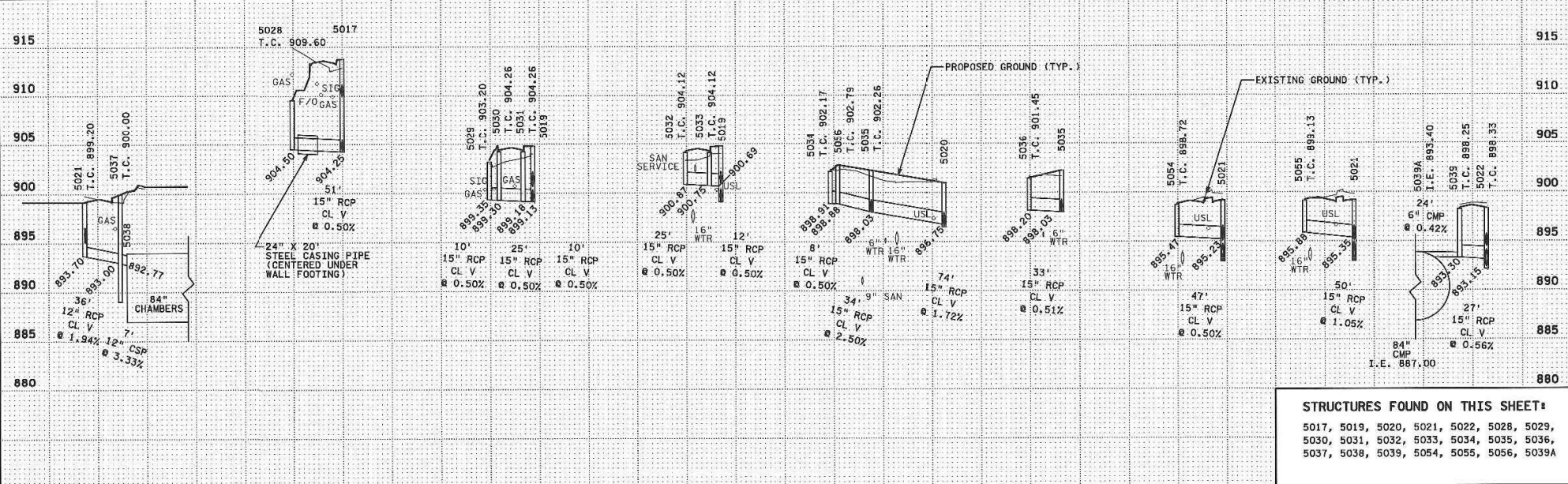
| STORM SEWER TABULATION | | | | | | | | | | | | | | | TAB S | | | | | | | | | | | | | | |
|--|-----------|----------|--------|----------------------------|-----------|----------------------|--------------|----------------------|-------------------|---------|---------|-------------|---------|----------------|---------|-----------|----------------------|--------------------------|-------|----------------------|------------------------|------------------------|-----------------------|-------------------------------|----------------------------------|-----------------|-------------|-------------|-------------|
| UPSTREAM STRUCTURE LOCATION (A) | | | | NEW STRUCTURE CONSTRUCTION | | | | | | | | | | PIPE SEWER (C) | | DRAINS TO | | CONN. TO EX. STORM SEWER | NOTES | | | | | | | | | | |
| STRUCTURE OR APRON INLET POINT NO. | ALIGNMENT | STATION | OFFSET | COORDINATES | | TOP OF CASTING ELEV. | OUTLET ELEV. | CASTING ASSEMBLY (B) | PAY HEIGHT DESIGN | | | | | | | | 12" RC DES 3006 CL V | | | 15" RC DES 3006 CL V | 18" RC DES 3006 CL III | 21" RC DES 3006 CL III | 24" STEEL CASING PIPE | CLEAN & TELEVIEWE STORM SEWER | STRUCT OR APRON OUTLET POINT NO. | SLOPE OF PIPE % | INLET ELEV. | | |
| | | | | X | Y | | | | DESIGN SPECIAL | | | | | | | | | | | | | | | | | | | DES SPEC. 4 | STEPS REQ'D |
| | | | | | | | | | 1 (2' x 3') | 3 (48") | 5 (96") | 6 (4' x 4') | 48-4020 | 60-4020 | 66-4020 | 84-4020 | | | | | | | | | | | | | |
| TYPE | EACH | LIN FT | | | | | | | | EACH | EACH | LIN FT | | LIN FT | LIN FT | | | | | | | | | | | | | | |
| 5021 | DALE-NB | 27+80.50 | 14.21 | LT | 565561.34 | 159314.41 | 899.20 | 894.00 | C-4 | 1 | | | | | | | | | | | 5037 | 1.94 | 893.00 | (E) | | | | | |
| 5028 | DALE-NB | 24+35.50 | 32.00 | RT | 563617.58 | 158972.01 | 909.60 | 904.50 | C-4 | 1 | | | | | | | | | | | 5017 | 0.50 | 904.25 | (G)(H) | | | | | |
| 5029 | DALE-NB | 25+70.00 | 22.00 | RT | 565599.23 | 159104.59 | 903.20 | 899.35 | C-4 | 1 | | | | | | | | | | | 5030 | 0.50 | 899.30 | | | | | | |
| 5030 | DALE-NB | 25+70.00 | 12.25 | RT | 565589.49 | 159104.34 | 904.26 | 899.30 | C-2 | 1 | 4.9 | | | | | | | | | | 5031 | 0.50 | 899.18 | | | | | | |
| 5031 | DALE-NB | 25+70.00 | 12.25 | LT | 565564.99 | 159103.70 | 904.26 | 899.18 | C-2 | 1 | 5.0 | | | | | | | | | | 5019 | 0.50 | 899.13 | | | | | | |
| 5032 | DALE-SB | 55+69.00 | 12.25 | LT | 565518.98 | 159103.54 | 904.12 | 900.87 | C-2 | 1 | 3.2 | | | | | | | | | | 5033 | 0.50 | 900.75 | | | | | | |
| 5033 | DALE-SB | 55+69.00 | 12.25 | RT | 565543.48 | 159104.15 | 904.12 | 900.75 | C-2 | 1 | 3.3 | | | | | | | | | | 5019 | 0.50 | 900.69 | | | | | | |
| 5034 | DALE-SB | 55+90.42 | 56.50 | LT | 565474.42 | 159124.85 | 902.17 | 898.91 | C-2 | 1 | 3.2 | | | | | | | | | | 5056 | 0.50 | 898.88 | | | | | | |
| 5035 | CENTRAL | 72+01.00 | 6.00 | LT | 565505.79 | 159150.21 | 902.26 | 898.03 | C-1 | 1 | | | | | | | | | | | 5020 | 1.72 | 896.75 | | | | | | |
| | CENTRAL | 71+99.71 | 6.00 | LT | 565504.50 | 159150.21 | | | | | | | | | | | | | | | | | | | | | | | |
| 5036 | CENTRAL | 71+70.00 | 19.25 | LT | 566474.75 | 159163.36 | 901.45 | 898.20 | C-2 | 1 | 3.2 | | | | | | | | | | 5035 | 0.51 | 898.03 | | | | | | |
| 5037 | DALE-NB | 27+80.50 | 23.32 | RT | 565598.87 | 159314.68 | 900.00 | 893.00 | C-1 | 1 | | | | | | | | | | | 5038 | 3.33 | 892.77 | (F) | | | | | |
| | DALE-NB | 27+78.50 | 20.66 | RT | 565596.22 | 159312.66 | 900.00 | | C-1 | 1 | | | | | | | | | | | | | | | | | | | |
| 5038 | DALE-NB | 27+87.00 | 40.00 | RT | 566615.50 | 159321.30 | | 892.77 | | | | | | | | | | | | | | | | | | | | | |
| 5039 | DALE-NB | 28+97.00 | 12.25 | RT | 565586.95 | 159431.10 | 898.25 | 893.30 | C-2 | 1 | 4.9 | | | | | | | | | | 5022 | 0.56 | 893.15 | | | | | | |
| 5039A | DALE-NB | 28+97.00 | 18.50 | RT | 565593.25 | 159431.14 | | 893.40 | | | | | | | | | | | | | 5039 | 0.42 | 893.30 | | | | | | |
| 5054 | DALE-SB | 57+95.00 | 12.25 | LT | 566517.19 | 159329.75 | 898.72 | 895.47 | C-2 | 1 | 3.2 | | | | | | | | | | 5021 | 0.50 | 895.23 | | | | | | |
| 5055 | DALE-SB | 57+55.00 | 12.25 | LT | 566517.48 | 159289.75 | 899.13 | 895.88 | C-2 | 1 | 3.2 | | | | | | | | | | 5021 | 1.05 | 895.35 | | | | | | |
| 5056 | DALE-SB | 55+90.40 | 49.00 | LT | 566481.92 | 159124.89 | 902.79 | 898.88 | C-2 | 1 | 3.8 | | | | | | | | | | 5035 | 2.50 | 898.03 | | | | | | |
| S.P. 062-653-011 SUBTOTALS (THIS SHEET ONLY) | | | | | | | | | 14 | 37.9 | | 8.8 | | | | | | | | | | | | | | | | | |



SPECIFIC NOTES:
 ① SKIDS SHALL BE DESIGNED BY CONTRACTOR SUCH THAT RCP CARRIER PIPE CAN BE PLACED AT THE LINE AND GRADE PER PLAN. SKIDS SHALL BE CAPABLE OF SUPPORTING THE RCP CARRIER PIPE.

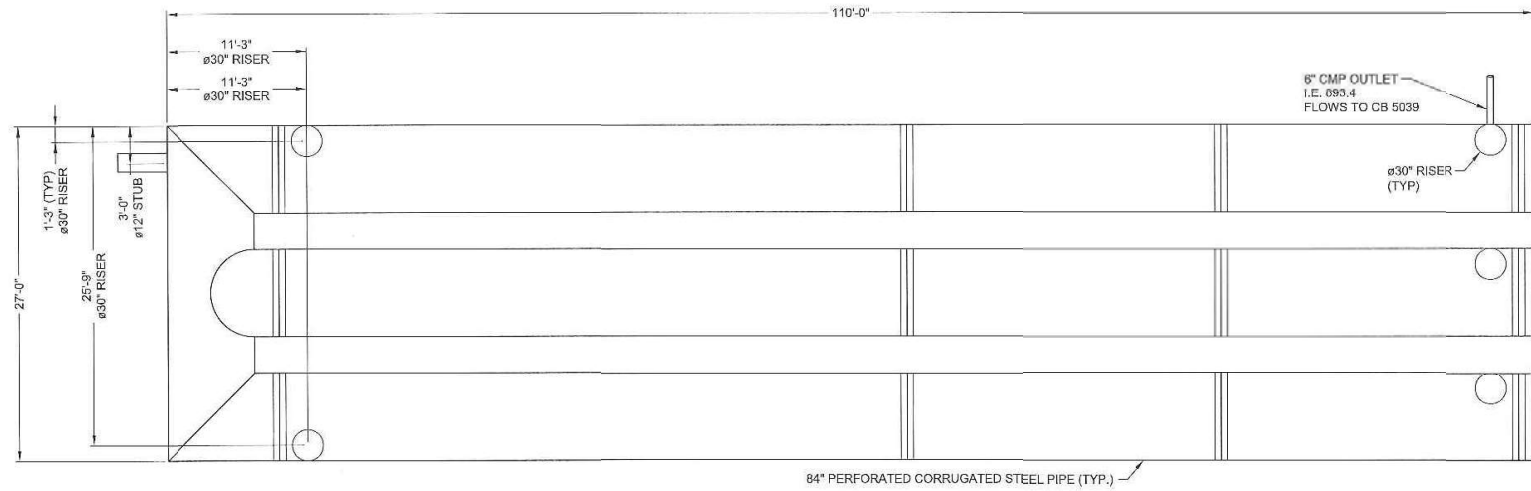
CASING PIPE CONNECTION
 NOT TO SCALE

NOTES:
 (A) STATION, OFFSET, COORDINATES, AND TOP OF CASTING ELEVATION FOR EACH POINT NUMBER ARE GIVEN AT CENTER OF GRATE OR COVER CASTING. ADDITIONAL COORDINATES GIVEN AT CENTER OF STRUCTURE. INVERT ELEVATIONS ARE GIVEN AT CENTER OF STRUCTURE.
 (B) SEE SHEET 134 FOR CASTING ASSEMBLY SUMMARY.
 (C) SEE SHEET 75 FOR STORM SEWER BEDDING DETAILS.
 (F) SEE SHEET 139B FOR FLOW CONTROL STRUCTURE DETAILS.
 (F) PRETREATMENT STORM SEDIMENT TRAP MANHOLE. SEE DETAIL ON SHEET 139B.
 (G) PLACE 2" THICK LOW DENSITY POLYSTYRENE SHEETS BETWEEN STEEL CASING PIPE AND BOTTOM OF WALL FOOTING (INCIDENTAL).
 (H) SEE CASING PIPE CONNECTION DETAILS THIS SHEET.



STRUCTURES FOUND ON THIS SHEET:
 5017, 5019, 5020, 5021, 5022, 5028, 5029, 5030, 5031, 5032, 5033, 5034, 5035, 5036, 5037, 5038, 5039, 5054, 5055, 5056, 5039A

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**Ramsey County
Stormwater BMP System**

ASSEMBLY
SCALE: 1" = 10'

PROJECT SUMMARY

CALCULATION DETAILS

- LENGTH PER BARREL = 103 FT
- LENGTH PER HEADER = 27 FT
- LOADING = HS20
- APPROX. CMP FOOTAGE = 336 FT

STORAGE SUMMARY

- STORAGE VOLUME REQUIRED = 17,500 CF
- PIPE STORAGE = 12,930 CF
- STRUCTURAL BACKFILL STORAGE = 4,571 CF
- TOTAL STORAGE PROVIDED = 17,502 CF

PIPE DETAILS

- DIAMETER = 84 IN
- CORRUGATION = 6" X 1" OR 3" X 1"
- GAGE = 16
- COATING = ALUMINIZED STEEL TYPE 2 (ALT2)
- WALL TYPE = PERFORATED
- BARREL SPACING = 36 IN

BACKFILL DETAILS

- WIDTH AT ENDS = 12 IN
- ABOVE PIPE = 6 IN
- WIDTH AT SIDES = 12 IN
- BELOW PIPE = 6 IN

CUMULATIVE VOLUME AT EACH ELEV.

| ELEVATION | VOLUME (CF) |
|-----------|-------------|
| 886.5 | 0 |
| 887 | 653 |
| 888 | 2635 |
| 889 | 5075 |
| 890 | 7710 |
| 891 | 10433 |
| 892 | 13068 |
| 893 | 15529 |
| 894 | 17502 |

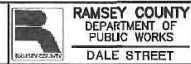
NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2 3/8" x 1/2" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISER3 TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES.
- QUANTITIES ARE APPROX. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- SEE SHEET 131 FOR LOCATION OF UNDERGROUND INFILTRATION SYSTEM.

| NO. | DATE | BY | DESCRIPTION OF REVISIONS |
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| | | | |

I HEREBY CERTIFY THAT THIS SHEET 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.

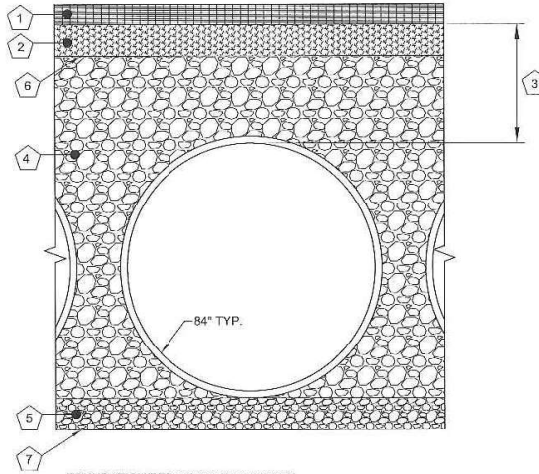
SIGNATURE: *Matthew A. Wassman*
 PRINTED NAME: MATTHEW A. WASSMAN
 DATE: 9/8/2019 LIC. NO. 26883



DRAINAGE DETAILS
UNDERGROUND INFILTRATION SYSTEM

S.P. 6282-235 (TH94), 164-020-145, 062-653-011
 Sheet No. 138 of 300 Sheets

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FOUNDATION BEDDING PREPARATION

PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER. ONCE THE FOUNDATION PREPARATION IS COMPLETE, THE 6 INCHES OF A WELL-GRADED GRANULAR MATERIAL SHALL BE PLACED AS THE BEDDING.

BACKFILL

THE BACKFILL MATERIAL SHALL BE FREE-DRAINING ANGULAR DOUBLE-WASHED, UNIFORM (UNIFORMITY COEFFICIENT OF 2 OR SMALLER) AGGREGATE BETWEEN 1.5 AND 3.0 INCH DIAMETER. MATERIAL SHALL BE PLACED IN 8"-10" MAXIMUM LIFTS. MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR-TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS. COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE PROJECT ENGINEER OR HIS REPRESENTATIVE IS SATISFIED WITH THE LEVEL OF COMPACTION. INADEQUATE COMPACTION CAN LEAD TO EXCESSIVE DEFLECTIONS WITHIN THE SYSTEM AND SETTLEMENT OF THE SOILS OVER THE SYSTEM. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO-LIFT DIFFERENTIAL BETWEEN THE SIDES OF ANY PIPE IN THE SYSTEM AT ALL TIMES DURING THE BACKFILL PROCESS. BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON ANY PIPES IN THE SYSTEM.

EQUIPMENT USED TO PLACE AND COMPACT THE BACKFILL SHALL BE OF A SIZE AND TYPE SO AS NOT TO DISTORT, DAMAGE, OR DISPLACE THE PIPE. ATTENTION MUST BE GIVEN TO PROVIDING ADEQUATE MINIMUM COVER FOR SUCH EQUIPMENT, AND MAINTAINING BALANCED LOADING ON ALL PIPES IN THE SYSTEM, DURING ALL SUCH OPERATIONS.

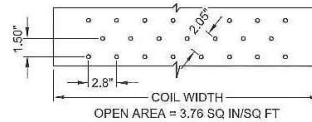
ACCEPTABLE ROCK TYPES: IGNEOUS AND CRYSTALLINE METAMORPHIC (GRANITE, RHYOLITE, GABBRO, BASALT, QUARTZITE). UNACCEPTABLE ROCK TYPES: CARBONATE (LIMESTONE, DOLOMITE, DOLOSTONE) AND NON-CRYSTALLINE METAMORPHIC (SHALE). OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS. REFER TO TYPICAL BACKFILL DETAIL FOR MATERIAL REQUIRED.

BACKFILL DETAIL

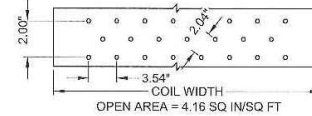
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- KEY**
- 1.) TOPSOIL OR CONCRETE WALK
 - 2.) COMMON EMBANKMENT
 - 3.) 12" MIN. FOR DIAMETERS THROUGH 96"
 - 4.) FREE DRAINING ANGULAR DOUBLE-WASHED, UNIFORM (UNIFORMITY COEFFICIENT OF 2 OR SMALLER) AGGREGATE BETWEEN 1.5 AND 3.0 INCH DIAMETER.
 - 5.) GRANULAR BEDDING, ROUGHLY SHAPED TO FIT THE BOTTOM OF PIPE, 6" IN DEPTH.
 - 6.) NON-WOVEN GEOTEXTILE REQUIRED ON TOP AND SIDES ONLY.
 - 7.) DO NOT PLACE GEOTEXTILE ON BOTTOM.

2 2/3" x 1/2" CORRUGATION - STEEL AND ALUMINUM CMP
 EDGE SPACING EQUAL ON BOTH SIDES



3" x 1" CORRUGATION - STEEL AND ALUMINUM CMP

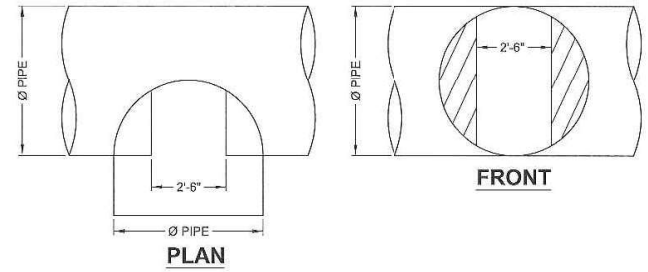


NOTES:

1. PERFORATIONS MEET AASHTO AND ASTM SPECIFICATIONS.
2. PERFORATION OPEN AREA PER SQUARE FOOT OF PIPE IS BASED ON THE NOMINAL DIAMETER AND LENGTH OF PIPE.
3. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
4. ALL HOLES Ø3/8".

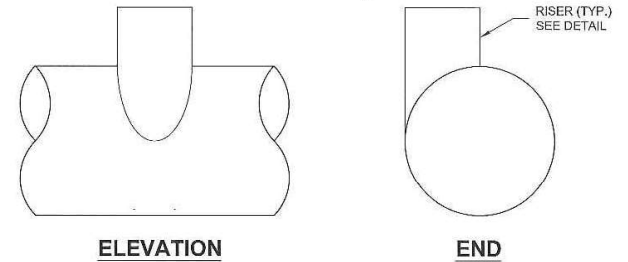
TYPICAL PERFORATION DETAIL

SCALE: N.T.S.



TYPICAL MANWAY DETAIL

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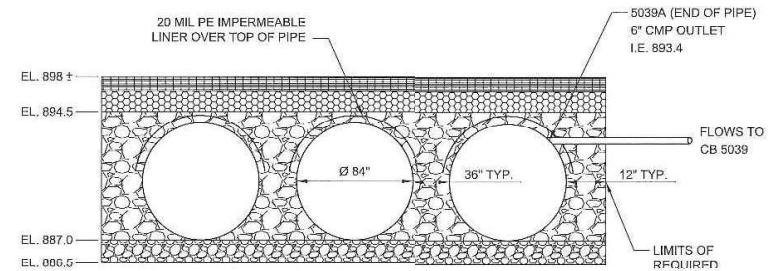


ELEVATION

END

TYPICAL RISER DETAIL

SCALE: N.T.S.



TYPICAL SECTION VIEW

LINER OVER ROWS

SCALE: N.T.S.

**Ramsey County
 Stormwater BMP System**

| NO. | DATE | BY | DESCRIPTION OF REVISIONS |
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| | | | |

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 SIGNATURE: *Matthew A. Wassman*
 PRINTED NAME: **MATTHEW A. WASSMAN**
 DATE: 9/16/2019 LIC. NO. 26893

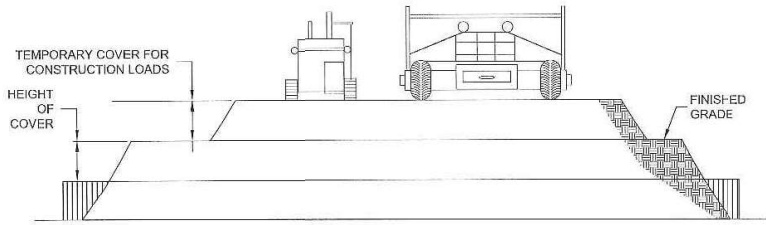
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TKDA

RAMSEY COUNTY
 DEPARTMENT OF PUBLIC WORKS
 DALE STREET

DRAINAGE DETAILS
 UNDERGROUND INFILTRATION SYSTEM

S.P. 6282-235 (TH94),164-020-145,062-653-011
Sheet No. 139 of 300 Sheets

DATE: 9/6/2019 TIME: 2:09:25 PM FILENAME: K:\n-r\ramsey\civ\5959000\04_Production\01_CAD\Highway\Streets\cd05265301L_ddc.dgn



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

| PIPE SPAN, INCHES | AXLE LOADS (kips) | | | |
|-------------------|--------------------|-------|--------|---------|
| | 18-50 | 50-75 | 75-110 | 110-150 |
| | MINIMUM COVER (FT) | | | |
| 12-42 | 2.0 | 2.5 | 3.0 | 3.0 |
| 48-72 | 3.0 | 3.0 | 3.5 | 4.0 |
| 78-120 | 3.0 | 3.5 | 4.0 | 4.0 |
| 126-144 | 3.5 | 4.0 | 4.5 | 4.5 |

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM
SCALE: N.T.S.

SPECIFICATION FOR UNDERGROUND INFILTRATION SYSTEM

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

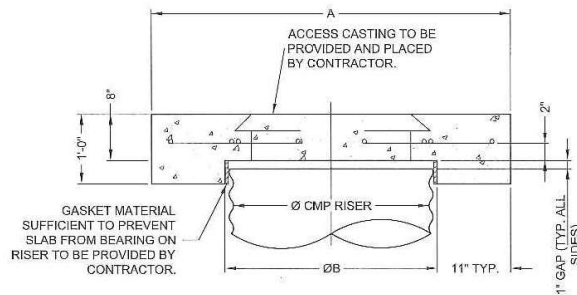
PIPE
THE PIPE SHALL MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2; AASHTO M-36 OR ASTM A-760.

HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSPA (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2.

INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 28, DIVISION II OR DIVISION II OR ASTM A-798 (FOR ALUMINIZED TYPE 2), AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTANCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

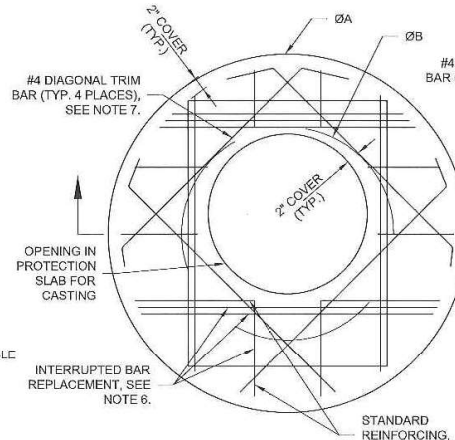
IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.



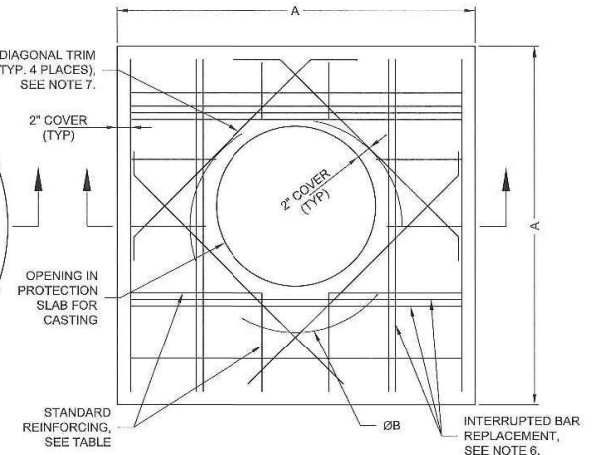
SECTION VIEW

| REINFORCING TABLE | | | | |
|-------------------|-----------------------|-----|--------------------------------|--------------------------|
| Ø CMP RISER | A | Ø B | REINFORCING | **BEARING PRESSURE (PSF) |
| 24" | Ø 4' 4"x4' | 26" | #5 @ 12" OCEW #5 @ 12" OCEW | 2,410 1,780 |
| 30" | Ø 4'-6" 4'-6" | 32" | #5 @ 12" OCEW #5 @ 12" OCEW | 2,120 1,530 |
| 36" | Ø 5' 5' x 5' | 38" | #5 @ 10" OCEW #5 @ 10" OCEW | 1,890 1,350 |
| 42" | Ø 5'-6" 5'-6" x 5'-6" | 44" | #5 @ 10" OCEW #5 @ 9" OCEW | 1,720 1,210 |
| 48" | Ø 6' 6' x 6' | 50" | #5 @ 9" OCEW #5 @ 8" OCEW | 1,600 1,100 |

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

- DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
- DESIGN LOAD HS20.
- EARTH COVER = 1" MAX.
- CONCRETE STRENGTH = 3,500 psi
- REINFORCING STEEL = ASTM A615, GRADE 60.
- PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
- TRIM OPENING WITH DIAGONAL #4 BARS. EXTEND BARS A MINIMUM OF 12" BEYOND OPENING. BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
- PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND PLACED BY CONTRACTOR.

MANHOLE CAP DETAIL
SCALE: N.T.S.

| NO. | DATE | BY | DESCRIPTION OF REVISIONS |
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| | | | |

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SIGNATURE: *Matthew A. Wassman*
PRINTED NAME: **MATTHEW A. WASSMAN**
DATE: **9/6/2019** LIC. NO. **26883**

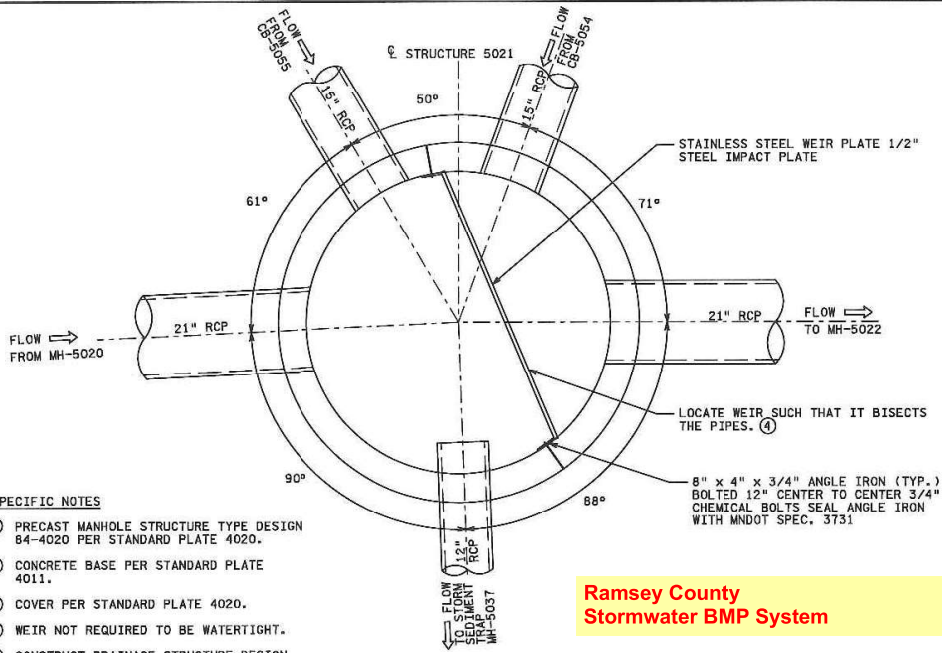
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RAMSEY COUNTY
DEPARTMENT OF PUBLIC WORKS
DALE STREET

DRAINAGE DETAILS
UNDERGROUND INFILTRATION SYSTEM

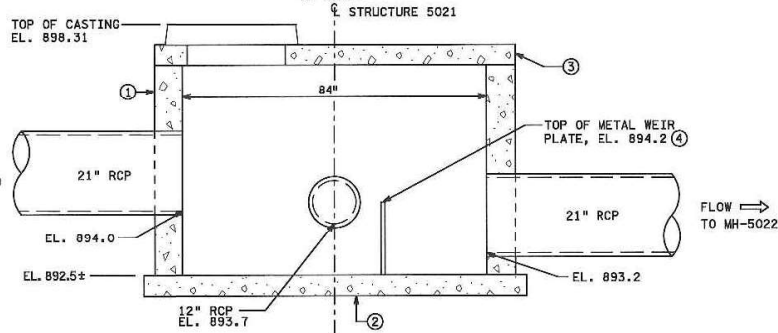
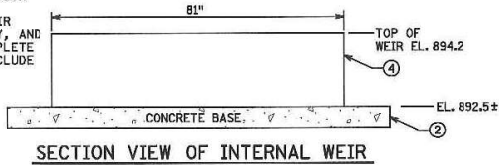
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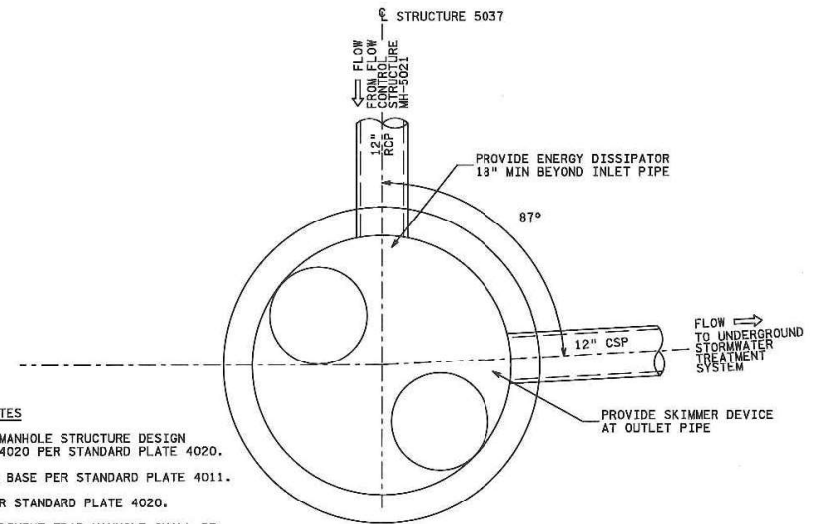


- SPECIFIC NOTES**
- ① PRECAST MANHOLE STRUCTURE TYPE DESIGN 84-4020 PER STANDARD PLATE 4020.
 - ② CONCRETE BASE PER STANDARD PLATE 4011.
 - ③ COVER PER STANDARD PLATE 4020.
 - ④ WEIR NOT REQUIRED TO BE WATERTIGHT.
 - ⑤ CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL 4 PAY ITEM CONSISTS OF CONCRETE STRUCTURE AND BASE, WEIR PLATE, PVC CAP, CASTING ASSEMBLY, AND ALL HARDWARE REQUIRED FOR A COMPLETE PLACEMENT. PAY ITEM DOES NOT INCLUDE INLET AND OUTLET PIPES.

Ramsey County
Stormwater BMP System

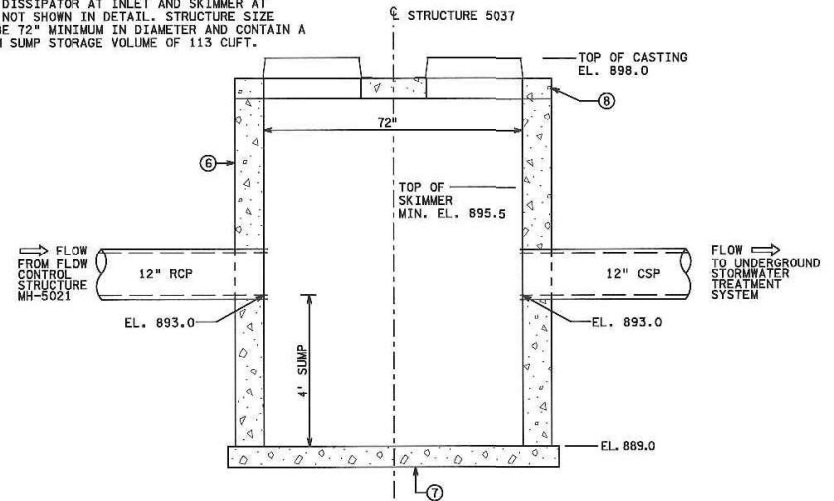


DRAINAGE STRUCTURE DESIGN SPECIAL 4 - FLOW CONTROL STRUCTURE ⑤
NO SCALE



- SPECIFIC NOTES**
- ⑥ PRECAST MANHOLE STRUCTURE DESIGN TYPE T2-4020 PER STANDARD PLATE 4020.
 - ⑦ CONCRETE BASE PER STANDARD PLATE 4011.
 - ⑧ COVER PER STANDARD PLATE 4020.
 - ⑨ STORM SEDIMENT TRAP MANHOLE SHALL BE THE PRESERVER™, SAFL BAFFLE™, SOLCLONE™, OR APPROVED EQUAL.
 - ⑩ CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL PAY ITEM CONSISTS OF CONCRETE STRUCTURE AND BASE, ENERGY DISSIPATOR, SKIMMER, CASTING ASSEMBLY, AND ALL HARDWARE REQUIRED FOR COMPLETE PLACEMENT. PAY ITEM DOES NOT INCLUDE INLET, OR OUTLET PIPE.
 - ⑪ ENERGY DISSIPATOR AT INLET AND SKIMMER AT OUTLET NOT SHOWN IN DETAIL. STRUCTURE SIZE SHALL BE 72" MINIMUM IN DIAMETER AND CONTAIN A MINIMUM SUMP STORAGE VOLUME OF 113 CUFT.

Ramsey County
Stormwater BMP System



DRAINAGE STRUCTURE DESIGN SPECIAL - STORM SEDIMENT TRAP MANHOLE ⑨⑩⑪
NO SCALE

| NO. | DATE | BY | DESCRIPTION OF REVISIONS |
|-----|------|----|--------------------------|
| | | | |

I HEREBY CERTIFY THAT THIS SHEET 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.
 SIGNATURE: *Matthew A. Wassman*
 PRINTED NAME: MATTHEW A. WASSMAN
 DATE: 10/14/2019 LIC. NO. 26883

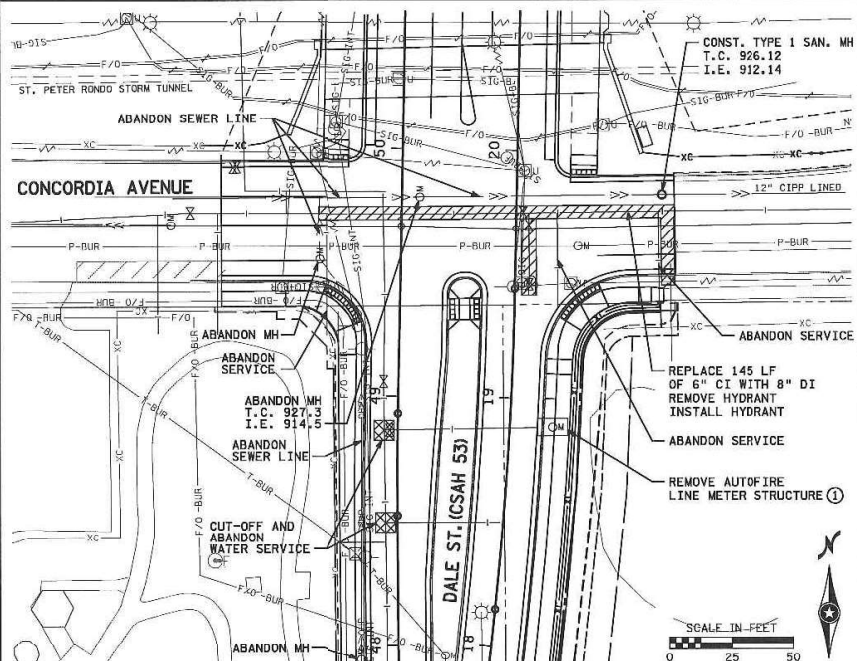
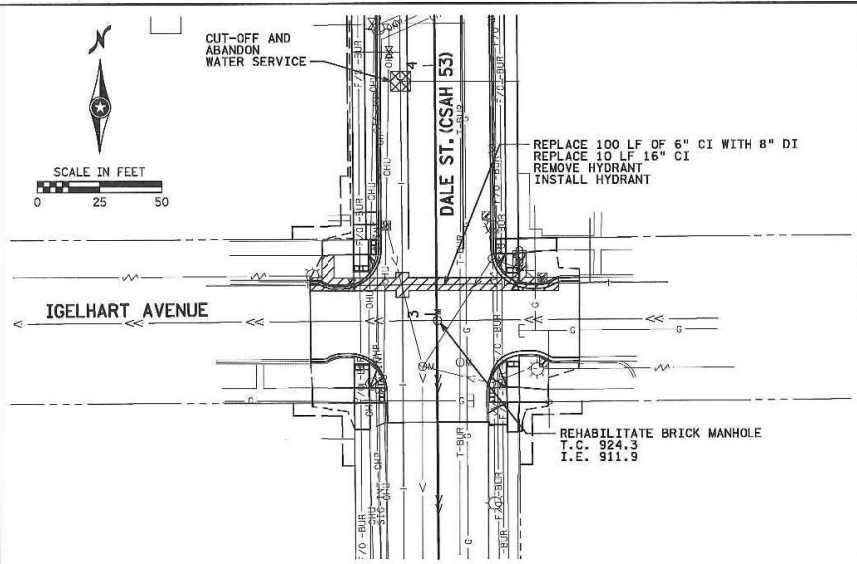
444 Cedar Street, Suite 1500
 Saint Paul, MN 55101
 651.292.4400
 tkda.com

RAMSEY COUNTY
 DEPARTMENT OF
 PUBLIC WORKS
 DALE STREET

DRAINAGE DETAILS

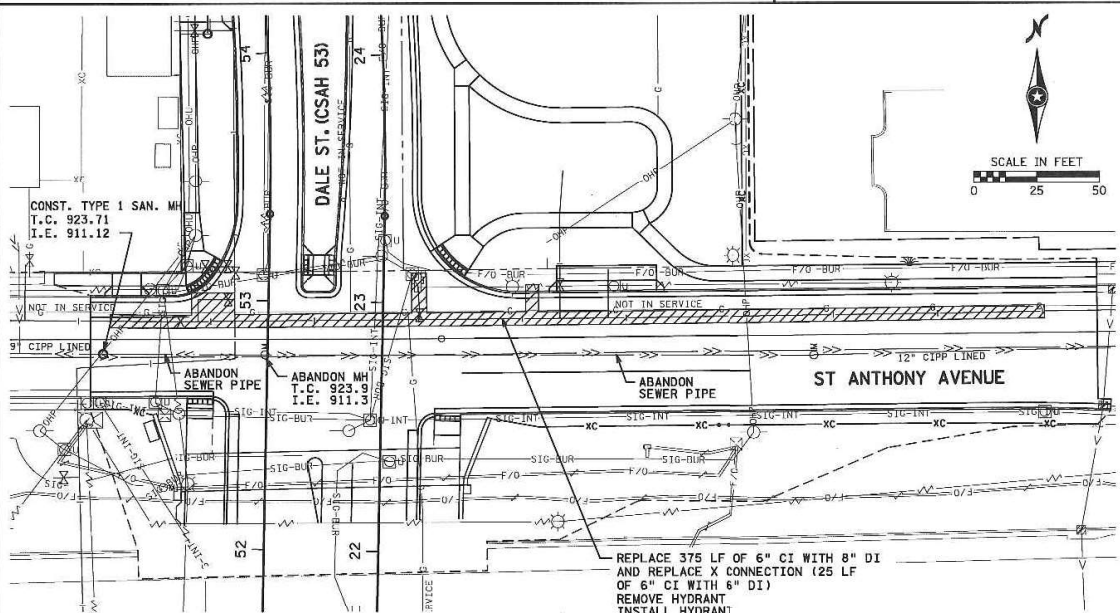
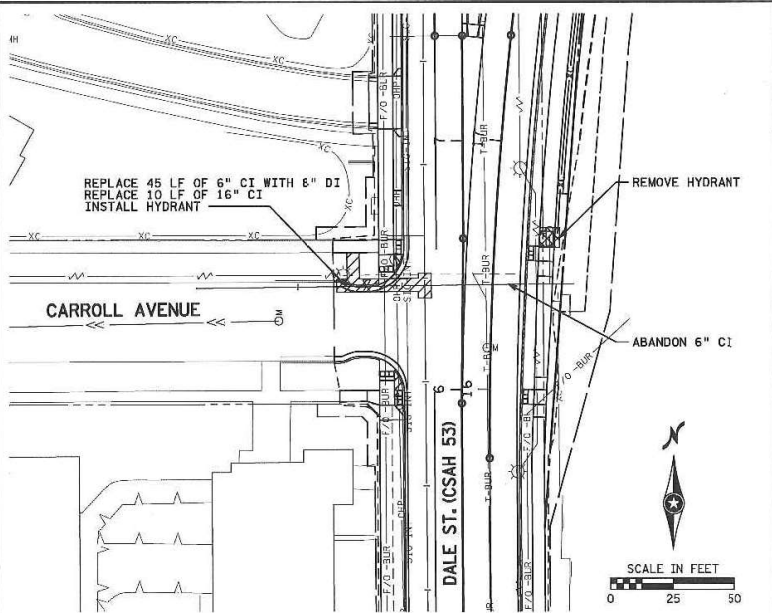
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 Sheet No.139B of 300 Sheets

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| NO. | DATE | BY | DESCRIPTION OF REVISIONS |
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I HEREBY CERTIFY THAT THIS SHEET 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.
 SIGNATURE: *Ronald S. Quanbeck*
 PRINTED NAME: RONALD S. QUANBECK
 DATE: 10/14/2019 LIC. NO. 19396



LEGEND

EXCAVATION - PAID FOR AS TRENCH EXCAVATION

EXCAVATION - PAID FOR AS WATER UTILITY HOLE

- GENERAL NOTES:**
- CONTRACTOR RESPONSIBLE FOR SCHEDULING, SHEETING OR SHORING NEEDED TO MEET THE STAGING PLANS. SEE SHEETS 166-221M.
 - ST. PAUL REGIONAL WATER SERVICES WILL REMOVE OR ABANDON, INSTALL WATERMAIN AND APPURTENANCES.
 - ST. PAUL REGIONAL WATER SERVICES WILL INSTALL ANODES AT SELECT EXCAVATIONS.
 - CONTRACTOR TO FURNISH MATERIAL AND PERFORM ALL WORK RELATED TO THE SANITARY SEWER.

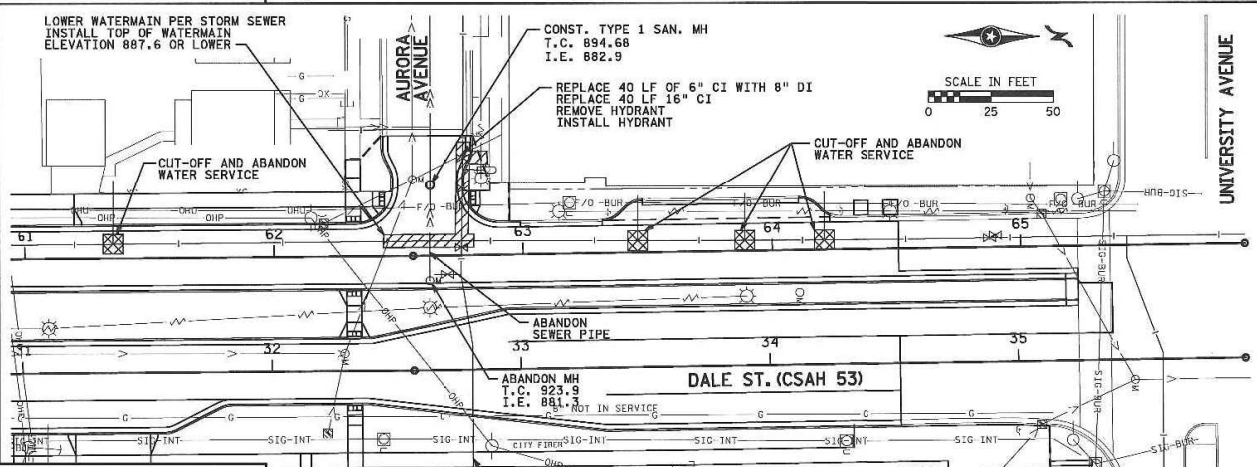
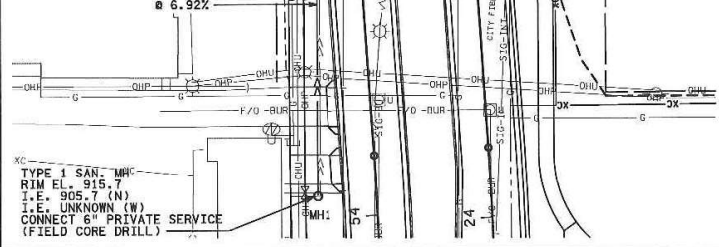
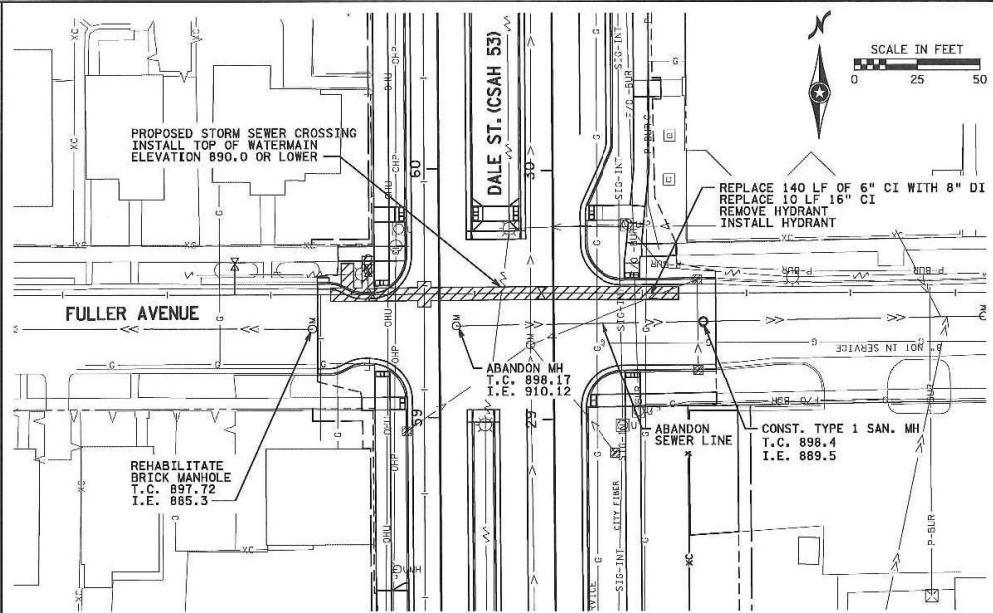
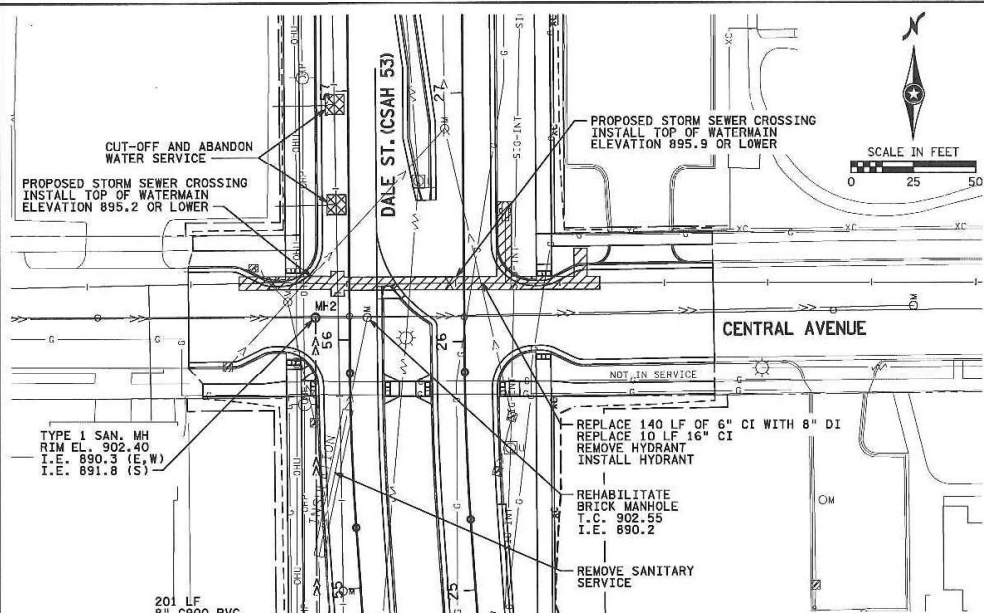
- SPECIFIC NOTES:**
- ① REMOVE 7' X 12' X 7' I.D. CAST-IN-PLACE AUTOFIRE STRUCTURE, INCLUDING FITTINGS. APPROXIMATE BOTTOM ELEV. 921. REMOVE 6" INVERT SERVICE LINE TO THE RIGHT-OF-WAY AND CAP. CAP 6" SERVICE LINE FROM DALE ST. OUTSIDE STRUCTURE. PAID FOR AS REMOVE CONCRETE STRUCTURE.

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RAMSEY COUNTY
 DEPARTMENT OF
 PUBLIC WORKS
 DALE STREET

UTILITY PLANS
 WATERMAIN AND SANITARY SEWER

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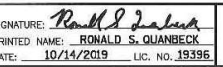
GENERAL NOTES:

- CONTRACTOR RESPONSIBLE FOR SCHEDULING, SHEETING OR SHORING NEEDED TO MEET THE STAGING PLANS. SEE SHEETS 166-221M.
- ST. PAUL REGIONAL WATER SERVICES WILL REMOVE OR ABANDON, INSTALL WATERMAIN AND APPURTENANCES.
- ST. PAUL REGIONAL WATER SERVICES WILL INSTALL ANODES AT SELECT EXCAVATIONS.
- CONTRACTOR TO FURNISH MATERIAL AND PERFORM ALL WORK RELATED TO THE SANITARY SEWER.

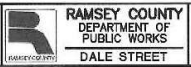
| LEGEND | |
|--------|---|
| | EXCAVATION - PAID FOR AS TRENCH EXCAVATION |
| | EXCAVATION - PAID FOR AS WATER UTILITY HOLE |

| NO. | DATE | BY | DESCRIPTION OF REVISIONS |
|-----|------|----|--------------------------|
| | | | |

I HEREBY CERTIFY THAT THIS SHEET 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.
 SIGNATURE: *Ronald S. Quaneck*
 PRINTED NAME: **RONALD S. QUANECK**
 DATE: 10/14/2019 LIC. NO. 19395



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 Saint Paul, MN 55101
 651.292.4400
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UTILITY PLANS
 WATERMAIN AND SANITARY SEWER