

GOVERNING SPECIFICATIONS

THE 2016 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN. AVAILABLE AT: <http://www.dot.state.mn.us/pre-letting/spec/index.html>

THE 2017 EDITION OF THE CITY OF DULUTH PUBLIC WORKS AND UTILITIES DEPARTMENT CONSTRUCTION STANDARDS AND SUPPLEMENTS OR ADDENDUMS SHALL APPLY.

AVAILABLE AT: <http://www.duluthmn.gov/engineering/standard-construction-specifications/>

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

WARNING:

LOCATION OF UNDERGROUND UTILITIES TO BE VERIFIED BY CONTRACTOR. CALL BEFORE DIGGING. GOPHER STATE ONE CALL 1-800-252-1166 REQUIRED BY LAW

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
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10-13	SITE 2 - BREWERY CREEK & E SKYLINE BLVD
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16	SITE 4 - OREGON CREEK & JEFFERSON ST

THIS PLAN CONTAINS 16 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.

THOMAS M PFEFFER

PROJECT ENGINEER (TYPED OR PRINTED NAME)

Thomas M. Pfeffer 6-13-2017 22442
PROJECT ENGINEER DATE LIC. NO.

CITY APPROVAL

Cledora 6/13/17
APPROVED CHIEF ENGINEER OF TRANSPORTATION DATE

SPS II 6-13-17
APPROVED CHIEF ENGINEER OF UTILITIES DATE

[Signature] 6-13-17
APPROVED CITY ENGINEER DATE

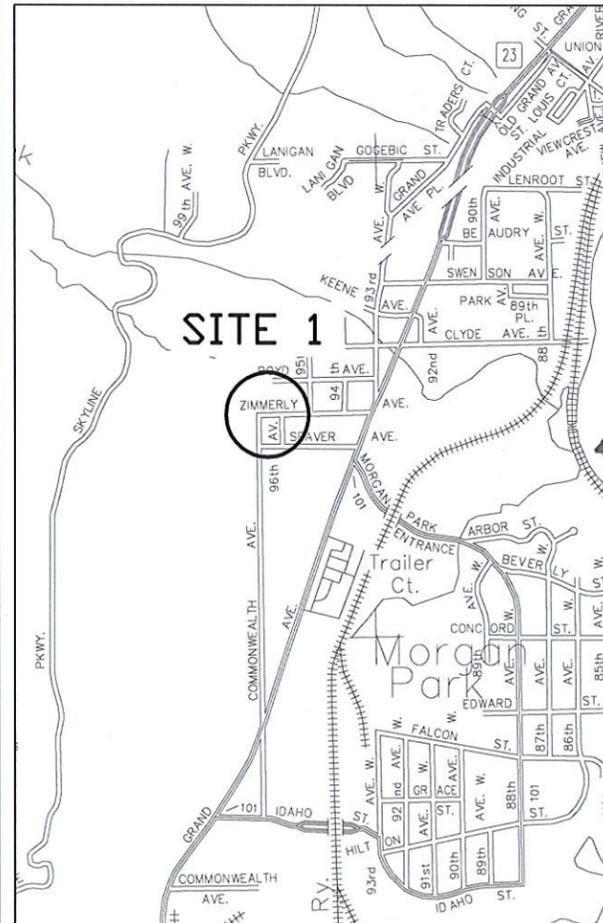
CITY OF DULUTH

DEPARTMENT OF PUBLIC WORKS AND UTILITIES ENGINEERING DIVISION

CONSTRUCTION PLANS FOR:

2017 BWSR SEDIMENT REDUCTION PROJECTS

CITY PROJECT NO. 1638



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

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PLAN LEGEND

RIGHT OF WAY LINE	---
DITCH CENTERLINE	---
FENCE LINE	---
RETAINING WALL	---
GRAVEL LINE	---
GUARD RAIL LINE	---
RAILROAD TRACK LINE	
ROAD CENTERLINE	---
TREE LINE	---
STREAM LINE	---
WETLAND LINE	---
EX SANITARY LINE	---
PR SANITARY LINE	---
AB SANITARY LINE	---
EX FORCEMAIN LINE	---
PR FORCEMAIN LINE	---
AB FORCEMAIN LINE	---
EX STORM LINE	---
PR STORM LINE	---
AB STORM LINE	---
EX WATER LINE	---
PR WATER LINE	---
AB WATER LINE	---
EX GAS LINE	---
PR GAS LINE	---
AB GAS LINE	---
EX STEAM LINE	---
PR STEAM LINE	---
AB STEAM LINE	---
UG CABLE TV LINE	---
AB CABLE TV LINE	---
UG ELECTRIC LINE	---
AB ELECTRIC LINE	---
UG FIBEROPTIC LINE	---
AB FIBEROPTIC LINE	---
UG TELEPHONE LINE	---
AB TELEPHONE LINE	---
OH ELECTRIC LINE	---
OH TELEPHONE LINE	---
OH CABLE TV LINE	---

SYMBOLS

EX SANITARY MANHOLE	(SAN)
EX SANITARY CLEANOUT	(X)
EX STORM MANHOLE	(STRM)
EX STORM CATCHBASIN	(W)
EX WATER MANHOLE	(W)
EX WATER VALVE	(WV)
EX WATER HYDRANT	(W)
EX WATER SHUTOFF	(W)
EX WATER & GAS MH	(W&G)
EX GAS MANHOLE	(GAS)
EX GAS VALVE	(GAS)
EX GAS SHUTOFF	(GAS)
EX STEAM MANHOLE	(STEAM)
EX TELEPHONE MANHOLE	(T)
EX ELECTRIC MANHOLE	(E)
EX POWERPOLE	(P)
EX LIGHT POLE	(L)
EX ELECTRIC VAULT	(V)
EX ANCHOR	(A)
EX ELECTRIC TRANSFORMER	(T)
EX STREET LIGHT	(S)
EX SIGNAL W/ STREET LIGHT	(S)
EX HANDHOLE	(H.H.)
EX HANDHOLE	(H.H.)
EX TELEPHONE PEDESTAL	(P)
EX WELL	(W)
BENCHMARK	(B)
FOUND CI MONUMENT	(M)
EX SIGN	(S)
CONTROL POINT	(C)
EX DECIDUOUS TREE	(D)
EX CONIFEROUS TREE	(C)
EX PARKING METER	(M)
EX SOIL BORING	(SB#)

SCHEDULE OF ESTIMATED QUANTITIES

NOTES

NOTES	LINE NO.	SPEC. NO.	DESCRIPTION	UNIT	SITE 1 - ZIMMERLY AVE EST. QUANTITY	SITE 2 - SKYLINE PRKWAY EST. QUANTITY	SITE 3 - E 5TH STREET EST. QUANTITY	SITE 4 - JEFFERSON STREET - EST. QUANTITY	TOTAL EST. QUANTITY
	1	2021.501	MOBILIZATION	LUMP SUM	0.25	0.25	0.25	0.25	1.00
1	2	2101.511	CLEARING AND GRUBBING (P)	LUMP SUM	0.25	0.25	0.25	0.25	1.00
	3	2104.501	REMOVE PIPE SEWER	LIN FT		129			129
	4	2104.501	REMOVE CONCRETE CULVERT	LIN FT	108	6	12		126
	5	2104.505	REMOVE BITUMINOUS PAVEMENT	SY	140				140
	6	2104.509	REMOVE CONCRETE HEADWALL	EACH	1				1
	7	2104.509	REMOVE CONCRETE PIPE APRON	EACH			1		1
	8	2104.509	REMOVE MANHOLE OR CATCH BASIN	EACH		1	2		3
	9	2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	48		40		88
1,2	10	2104.601	REMOVE MISCELLANEOUS DEBRIS	LUMP SUM	0.25	0.25	0.25	0.25	1.00
1	11	2104.601	REMOVE MISCELLANEOUS DEBRIS SPECIAL (GABION CLEANING)	LUMP SUM				1.00	1.00
	12	2105.523	COMMON BORROW (LV)	CU YD		80	480		560
	13	2105.522	SELECT GRANULAR BORROW MOD 7% (ROAD BASE)	CU YD	60		10		70
	14	2105.601	SITE GRADING (SITE 4) (P)	LUMP SUM				1.00	1.00
	15	2211.503	AGGREGATE BASE (CV) CLASS 5	CU YD	60		10		70
	16	2360.501	TYPE SP 9.5 WEARING COURSE MIX (3,C) (1.5" thick)	TON	15		1		16
	17	2360.502	TYPE SP 12.5 NON WEAR COURSE MIX (3,C) (2")	TON	20		2		22
	18	2451.503	GRANULAR BACKFILL (CV)	CU YD	100				100
3	19	2501.511	36" RC PIPE CULVERT DES 3006 CL V	LIN FT	106				106
	20	2501.511	60" RC PIPE CULVERT DES 3006 CL III	LIN FT			16		16
5	21	2501.515	36" RCP PIPE APRON	EACH	2				2
5	22	2501.515	60" RCP PIPE APRON	EACH			1		1
	23	2503.602	CONSTRUCTION JOINT, 12" RC PIPE	EACH			1		1
	24	2503.602	CONSTRUCTION JOINT, 60" RC PIPE	EACH			1		1
5	25	2503.603	12" HDPE PIPE SEWER SDR 17	LIN FT		130			130
9	26	2503.603	60" CIPP LINER STORM CULVERT	LIN FT		141	147		288
	27	2503.605	TUNNEL REPAIR - TUCK POINTING	CU FT		23			23
	28	2503.605	TUNNEL REPAIR - ROCK VOID FILLING	CU FT		15			15
	29	2503.607	TUNNEL REPAIR - POURED CONCRETE FLOOR	CU YD		3.5			3.5
	30	2506.502	CONSTRUCT DRAINAGE STRUCTURE, DESIGN 60-4020	LIN FT	11.3				11.3
	31	2506.502	CONSTRUCT DRAINAGE STRUCTURE, DESIGN G	LIN FT			6.8		6.8
	32	2506.516	CASTING ASSEMBLY	EACH	1		2		3
	33	2506.602	ANCHORED MANHOLE (SITE 2)	LUMP SUM		1.00			1.00
	34	2511.501	RANDOM RIPRAP CLASS III	CU YD	30	20	80	35	165
10	35	2511.501	RANDOM RIPRAP CLASS IV	CU YD		20	60	35	115
10	36	2511.607	RIPRAP GROUT (3-A)	CU YD		5	15	25	45
	37	2563.601	TRAFFIC CONTROL	LUMP SUM	0.25	0.25	0.25	0.25	1.00
4	38	2573.502	SILT FENCE TYPE HI	LIN FT	150	150			300
	39	2573.530	STORM DRAIN INLET PROTECTION	EACH		2			2
4	40	2573.533	SEDIMENT CONTROL LOG TYPE STRAW	LIN FT	160	300	400	150	1010
8	41	2574.508	FERTILIZER TYPE 3	POUND	32	95	46	21	194
6	42	2574.525	COMMON TOPSOIL BORROW (LV)	CU YD	36	108	52	24	221
	43	2575.501	SEEDING	ACRE	0.09	0.27	0.13	0.06	0.55
7	44	2575.502	SEED MIXTURE 25-151	POUND	11	10			21
11	45	2575.502	SEED MIXTURE 25-141	POUND		11	8	4	23
4	46	2575.523	EROSION CONTROL BLANKETS CATEGORY 3	SY	420	1300	600	300	2620

- 1 ALL DEBRIS SHALL BE DISPOSED OF OFF SITE.
- 2 INCLUDES REMOVAL & DISPOSAL OF DOWNED TREES, WOODY DERIS & GARBAGE IN THE PROJECT AREA TO INCLUDE THE ENTIRE INLET AND PLUNGE POOL AREAS AT ALL SITES. ITEM INCLUDES REMOVAL & DISPOAL OF 50 TIRES USED FOR SLOPE STABILIZATION AT SITE 1.
- 3 LENGTHS DISPLAYED ON PLAN PAGES INCLUDE APRON LAYING LENGTHS. PAYMENT WILL BE BASED ON LENGTHS OF PIPE SECTIONS ONLY. APRONS WILL BE PAID FOR SEPERATELY.
- 4
- 5 ACTUAL LOCATION & QUANTITES OF EROSION CONTROL DEVICES WILL VARY WITH SITE CONDITIONS AS WELL AS WORK METHODS & SEQUENCING CHOSEN BY THE CONTRACTOR.
- 6 PIPE INLETS & OUTLETS SHALL BE STABILIZED WITHIN 24 HOURS OF INSTALLATION.
- 7 PLACED TO A DEPTH OF 4" IN EXCAVATED AREAS. PLACED AT A DEPTH OF 1" IN AREAS OF SOD ONLY DISTURBANCE.
- 8 APPLY IN MOWED AREAS AT A RATE OF 120 LB/ACRE.
- 9 PLACED AT A RATE OF 200 LB/ACRE.
- 10 BID ITEM SHALL INCLUDED ALL COSTS OF MATERIAL AND INSTALLATION INCLUDING WASTED DRY LINER LENGTH USED FOR INSERTION.
- 11 ON STEEP SLOPES, THE CONTRACTOR SHALL EMPLOY SPECIAL METHODS TO PREVENT RIPRAP AND GROUT FROM MIGRATING DOWNSLOPE BEYOND INTENDED PLACEMENT AREAS.
- 12 APPLY IN UNMOWED AREAS AT A RATE OF 60 LB/ACRE.

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SIGNATURE: *Thomas M. Pfeiffer*

THOMAS M PFEFFER
TYPE NAME

DATE: 6/13/2017

LIC. NO: 22442



CITY OF DULUTH
ENGINEERING DIVISION
411 W. 1ST ST. STE. 211
DULUTH, MN 55802

2017 BWSR SEDIMENT REDUCTION PROJECTS

CITY PROJECT NO.: 1638

STATE AID PROJECT NO.: NA

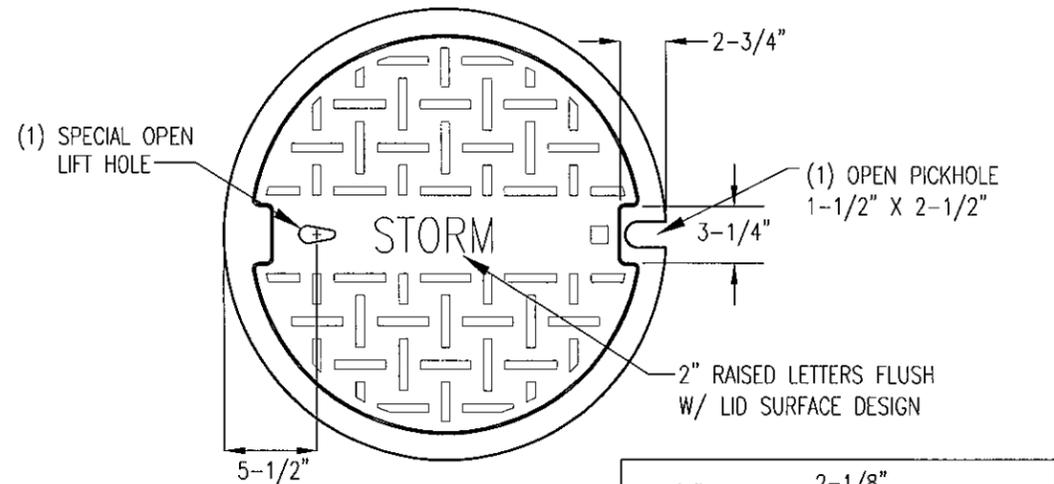
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SEQ

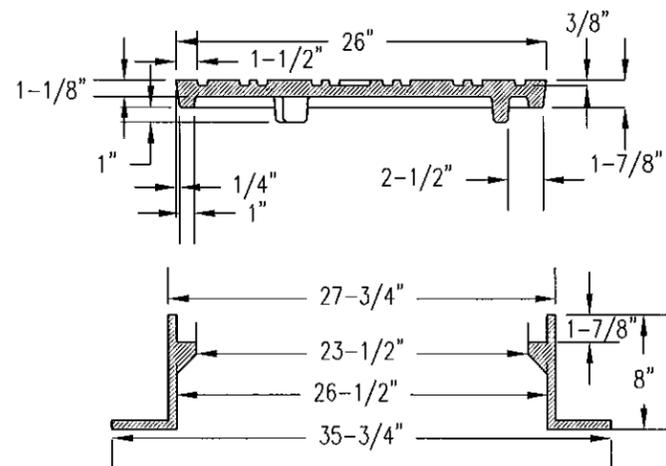
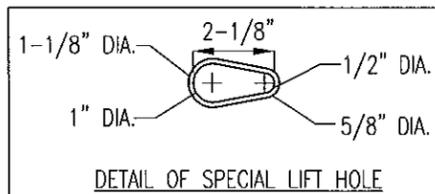
SHEET NO. 2 OF 16

WGT. 298 LBS	MATL. GRAY IRON CLASS 35B
WGT. 122 LBS	TOT.WGT. 420 LBS. SPEC. ASTM A-48-74

NOTE: SUITABLE FOR HS25 WHEEL LOADS



NOTE: T/CAST SHALL BE .03" BELOW FINISHED PAVEMENT SURFACE.



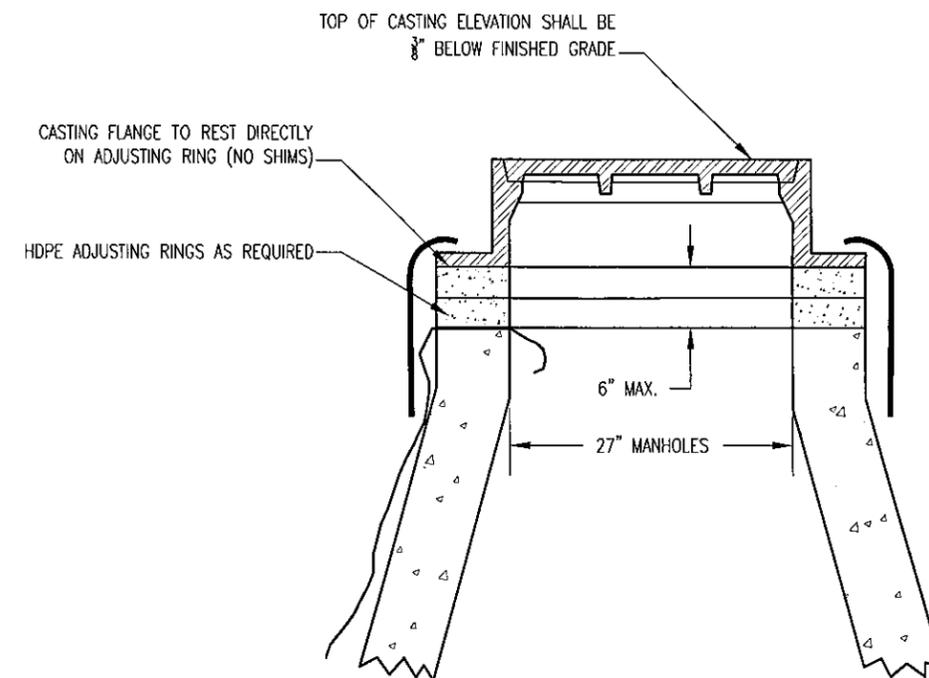
STORM MANHOLE CASTING

STRM-1

REVIEWED/APPROVED 2/01/2013

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



STORM MANHOLE NON-PAVED AREAS

STRM-5

REVIEWED/APPROVED 02/19/2015

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

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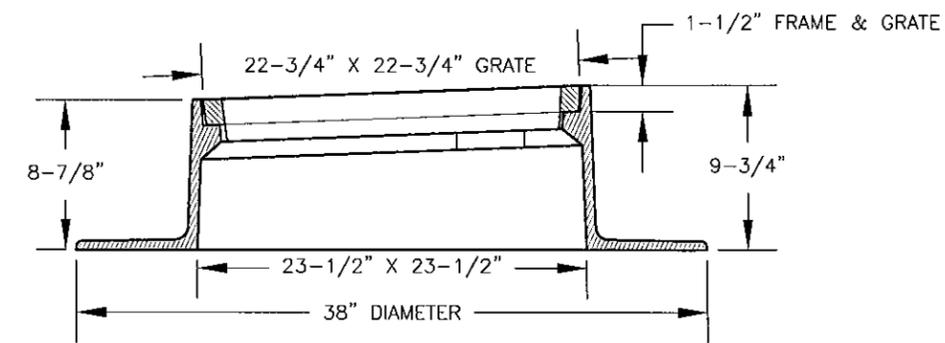
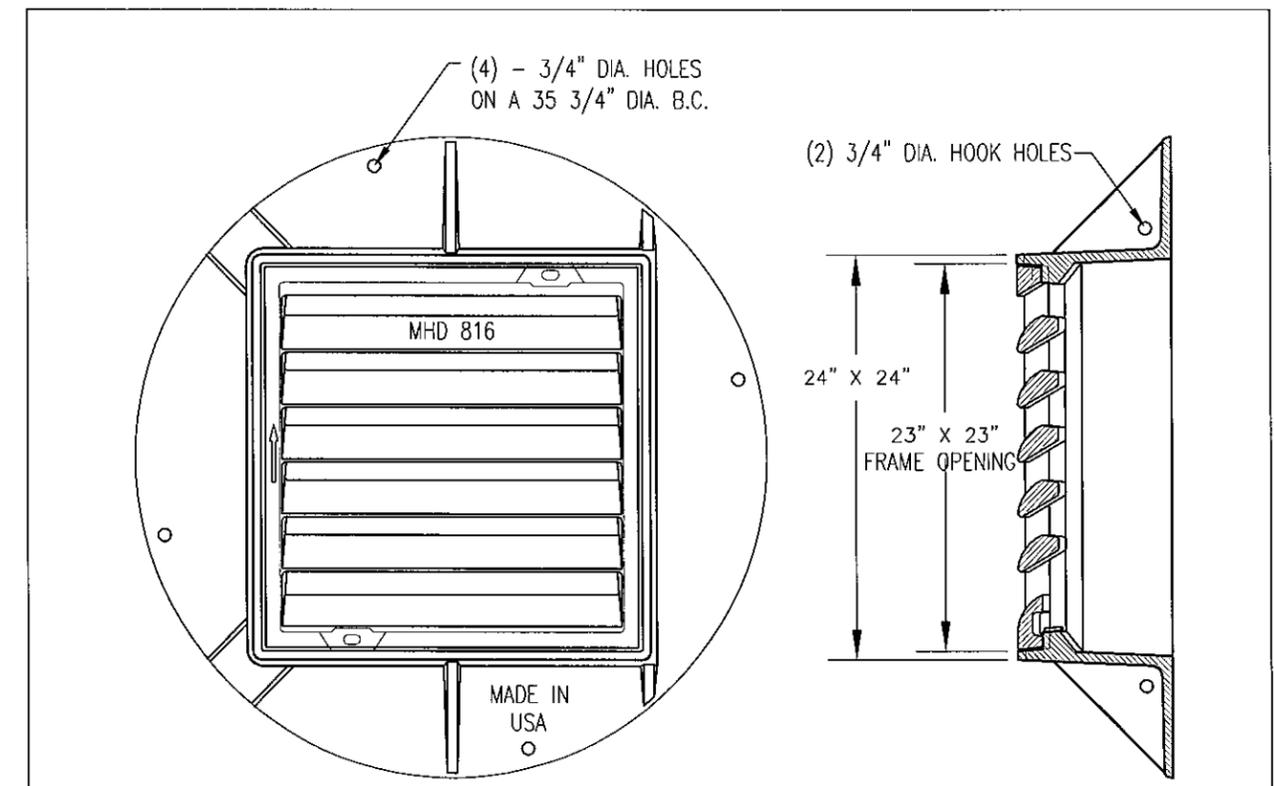
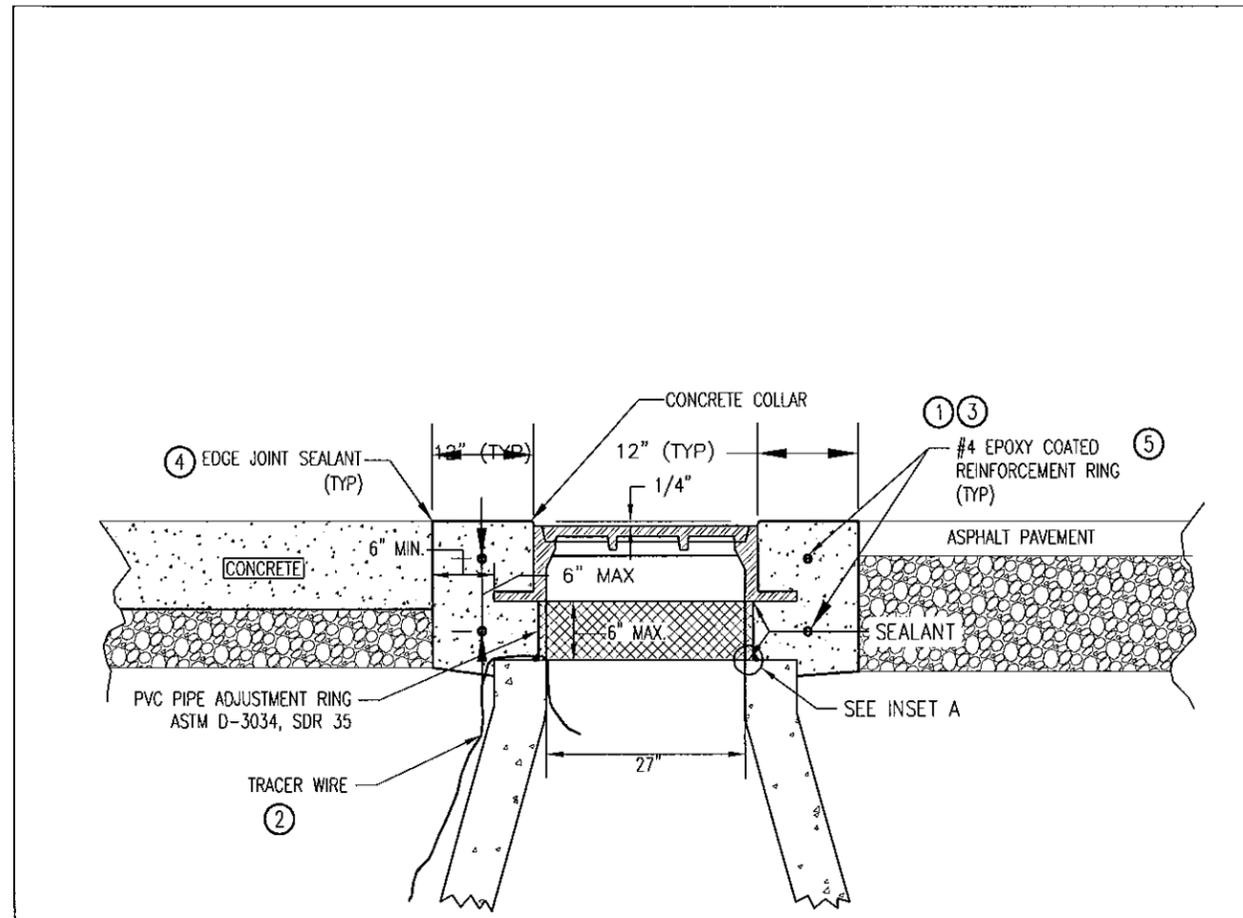
CITY PROJECT NO.: 1638

STATE AID PROJECT NO.: NA

DRAWN BY: JJM

DETAILS 1

SHEET NO. 3 OF 16



- NOTES:
1. COMPONENT NO'S: FRAME 5005, GRATE 816 (STD PLATE 4154B).
 2. MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
 3. WEIGHT: FRAME 262#; GRATE 131#
 4. ALL GUTTERS UPSTREAM OF CATCH BASINS SHALL BE STAMPED, "NO DUMPING, LEADS TO LAKE" WITH A CITY SUPPLIED STAMP.

CONCRETE ENCASED CASTING COLLAR FOR STORM MH IN ROADWAY, WALKS, & DRIVES		STRM-5A
REVIEWED/APPROVED 01/20/2017	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE

CATCH BASIN CASTINGS		STRM-3
REVIEWED/APPROVED 1/8/2016	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE

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SIGNATURE: *Thomas M. Pfeffer*

THOMAS M. PFEFFER
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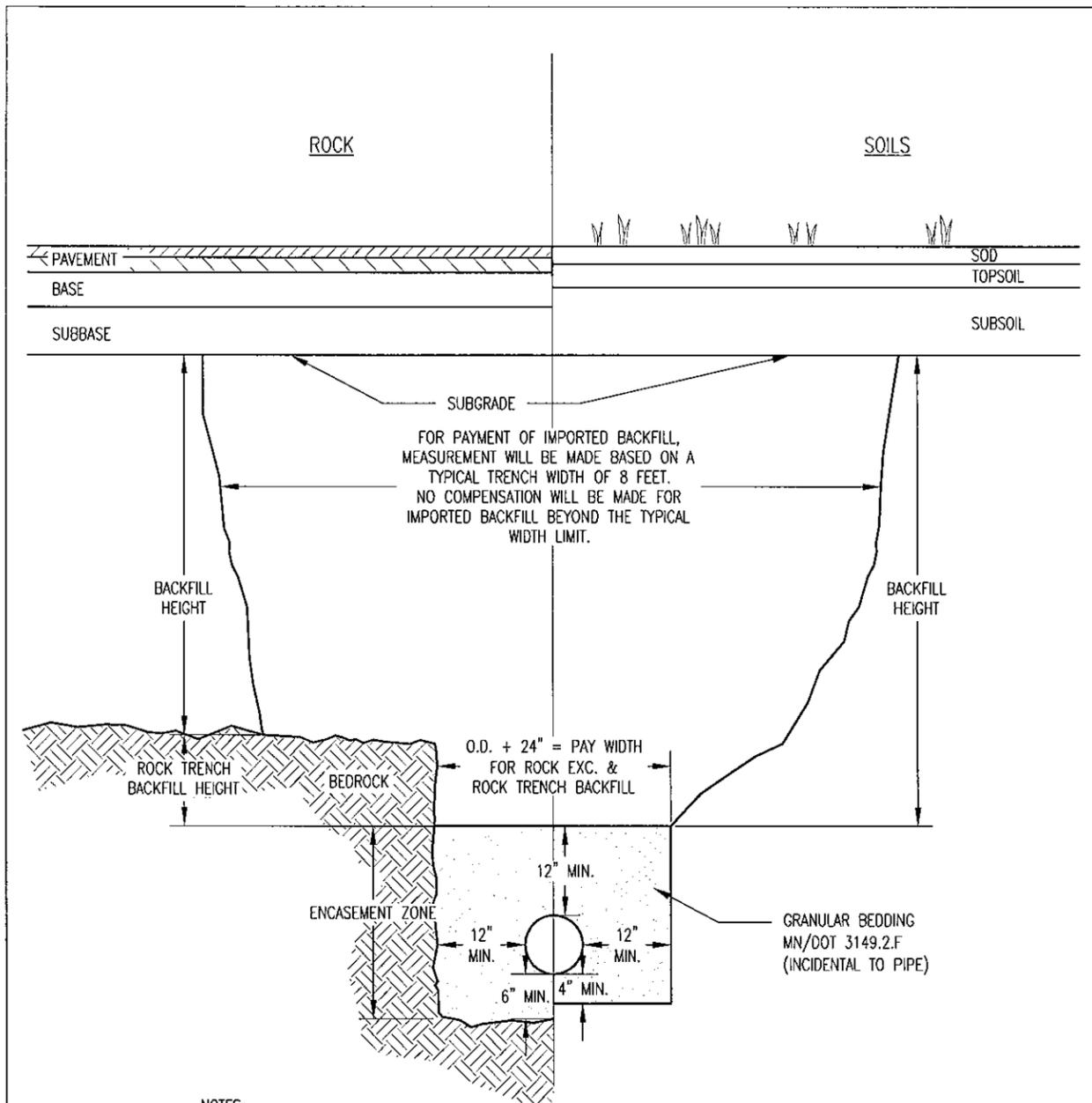


CITY OF DULUTH
ENGINEERING DIVISION
411 W. 1ST ST. STE. 211
DULUTH, MN 55802

2017 BWSR SEDIMENT REDUCTION PROJECTS

CITY PROJECT NO.: 1638 STATE AID PROJECT NO.: NA

DRAWN BY: JIM
DETAILS 2
SHEET NO. 4 OF 16



FOR PAYMENT OF IMPORTED BACKFILL, MEASUREMENT WILL BE MADE BASED ON A TYPICAL TRENCH WIDTH OF 8 FEET. NO COMPENSATION WILL BE MADE FOR IMPORTED BACKFILL BEYOND THE TYPICAL WIDTH LIMIT.

NOTES:

1. EXCESS EXCAVATION MATERIAL SHALL BE DISPOSED OF OFF PROJECT R.O.W. (INCIDENTAL)
2. PAY WIDTH FOR ROCK EXCAVATION SHALL BE BASED ON OUTSIDE DIAMETER OF PIPE PLUS 24".
3. A MINIMUM OF 1 CUBIC YARD OF STRUCTURE EXCAVATION, CLASS R, WILL BE PAID FOR EVERY 10' OF PIPE WHERE ROCK REMOVAL IS REQUIRED.
4. TRENCH STABILIZATION BEDDING MATERIAL MAY BE USED IN AREAS AS DETERMINED BY THE ENGINEER.
5. ENCASEMENT ZONE MATERIAL SHALL BE COMPACTED TO 95% OF MAXIMUM STANDARD PROCTOR DENSITY.
6. BACKFILL SHALL BE SELECT GRADING MATERIAL FOUND ON-SITE WHEN DEEMED SUITABLE BY THE ENGINEER OR AS OTHERWISE DEFINED IN THE PROJECT SPECIAL PROVISIONS. WHEN ON-SITE MATERIAL IS NOT SUITABLE AND WHEN BACKFILL MATERIAL IS NOT SPECIFIED, IMPORTED MATERIAL MEETING MN/DOT 3149.2.D.1 GRANULAR BACKFILL SHALL BE PROVIDED. USE OF NATIVE ON-SITE MATERIAL IS INCIDENTAL.
7. COMPACT BACKFILL MATERIALS TO 100% OF MAXIMUM STANDARD PROCTOR DENSITY FOR THE UPPER 3' BELOW THE SUBGRADE, AND TO 95% OF MAXIMUM STANDARD PROCTOR DENSITY BELOW THE UPPER 3'.

DUCTILE IRON, PE WATERMAIN, PRESSURE SEWER, & FORCEMAIN BEDDING

EX-1

REVISED/APPROVED 01/20/2017

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

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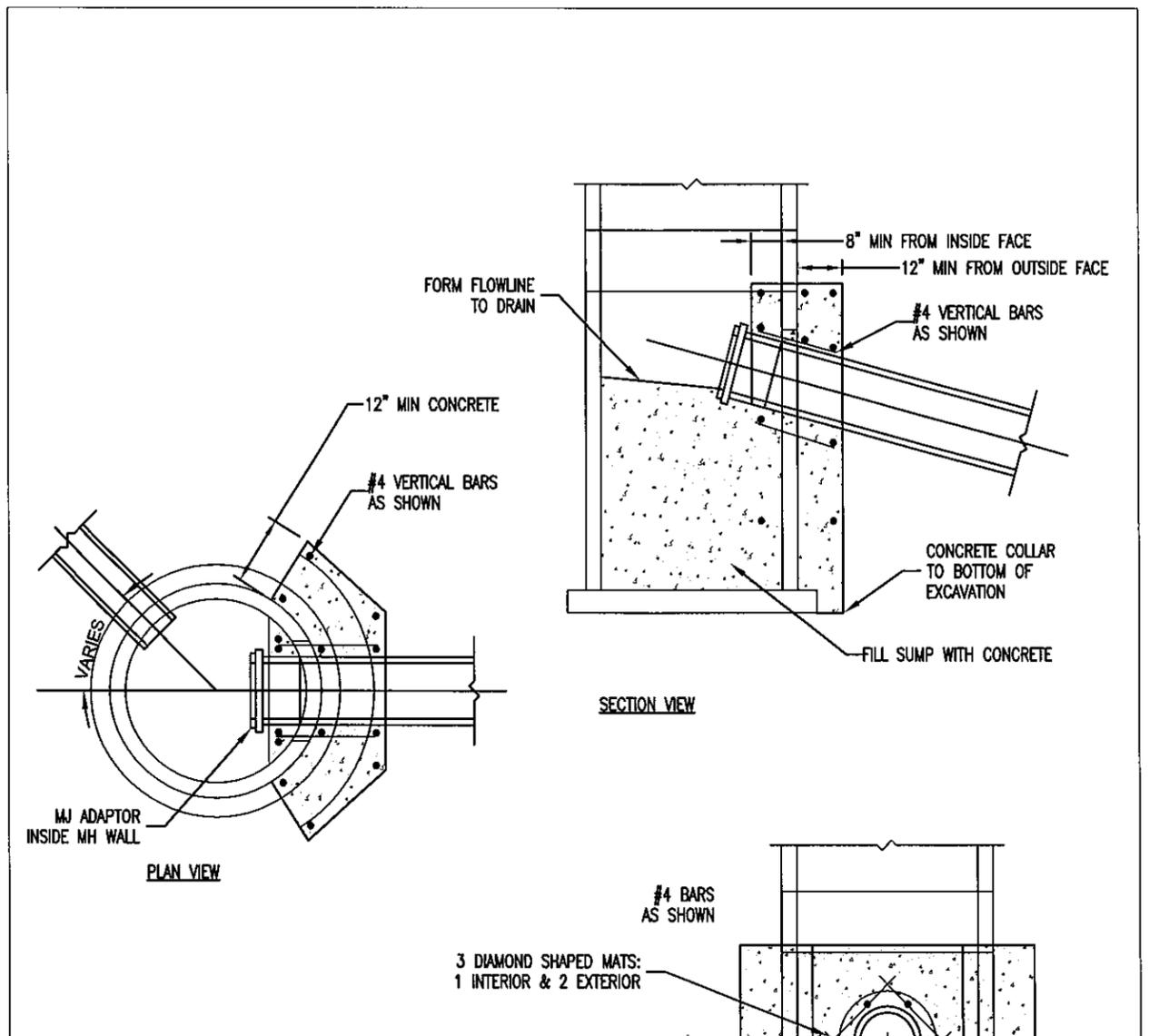
THOMAS M. PFEFFER
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DATE: 6/13/2017

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STEEL REINFORCING SCHEDULE

INDEX	SIZE	LENGTH (IN)	QUANTITY	DESCRIPTION
①	4	27	12	DIAMOND SHAPED MAT
②	4	28	6	LONGITUDINAL THRU DOGHOUSE
③	4	72	8	VERTICAL - INTERIOR
④	4	76	6	VERTICAL - EXTERIOR
⑤	4	28	4	HORIZONTAL - INTERIOR
⑥	4	76	6	HORIZONTAL - EXTERIOR

NOTES:
#4 EPOXY COATED REBAR
MAINTAIN 2" CLEARANCE

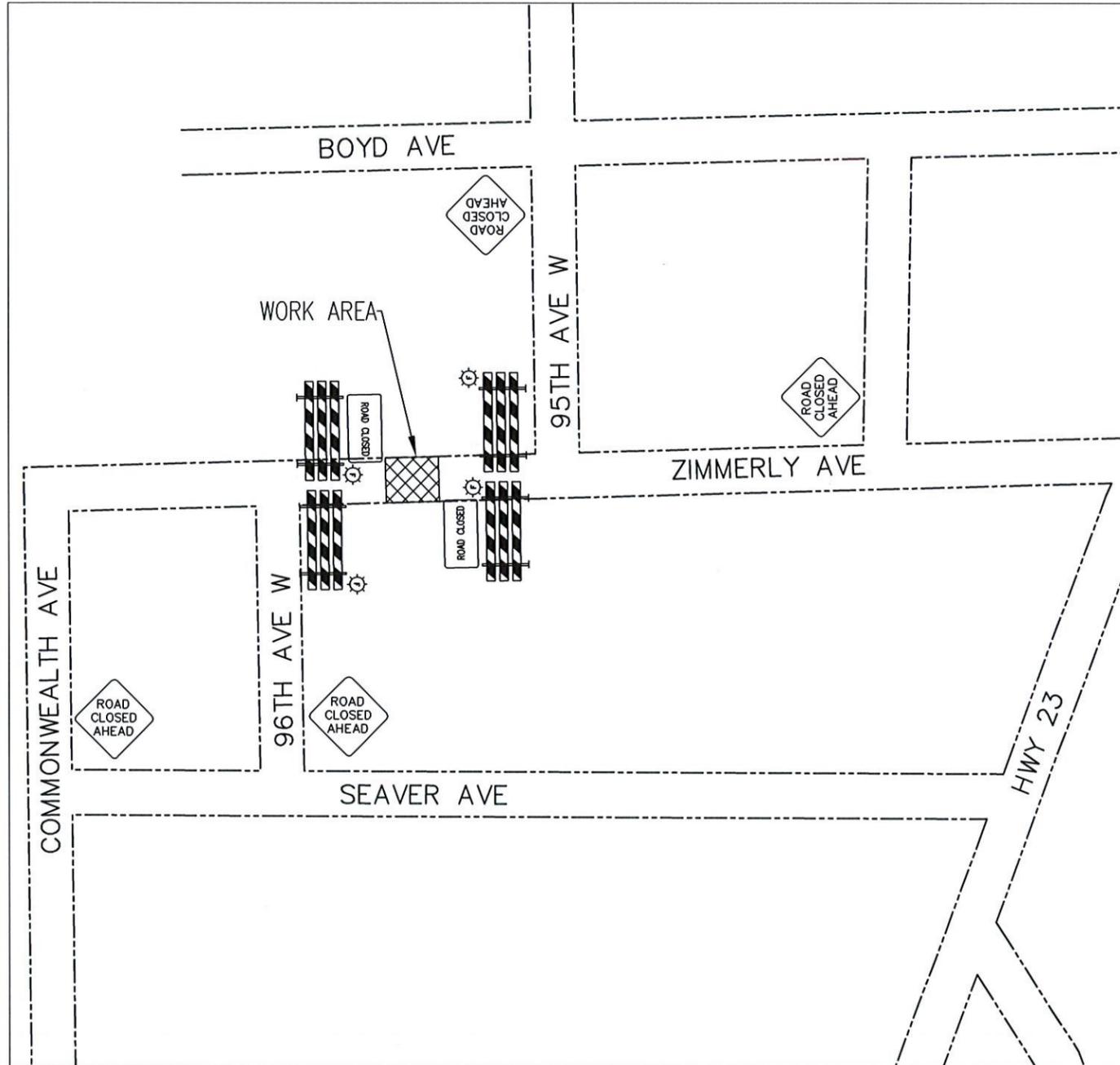
ANCHORED STORM MANHOLE

REVISED/APPROVED 5/1/2017

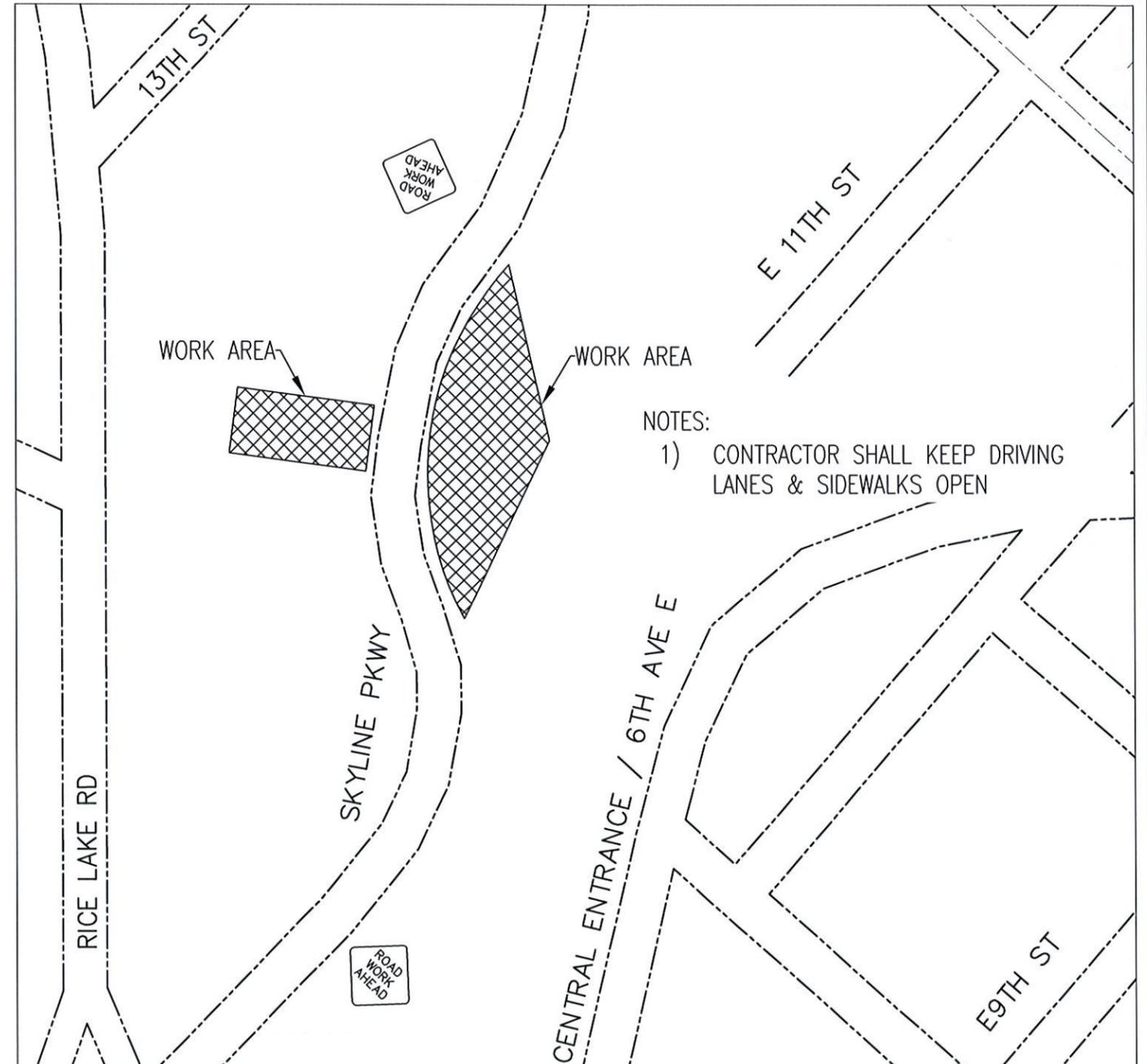
CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

SITE 1 – ZIMMERLY AVE
TRAFFIC CONTROL PLAN



SITE 2 – SKYLINE PARKWAY
TRAFFIC CONTROL PLAN



- NOTES:
1) CONTRACTOR SHALL KEEP DRIVING LANES & SIDEWALKS OPEN

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2017 BWSR SEDIMENT REDUCTION PROJECTS

CITY PROJECT NO.: 1638

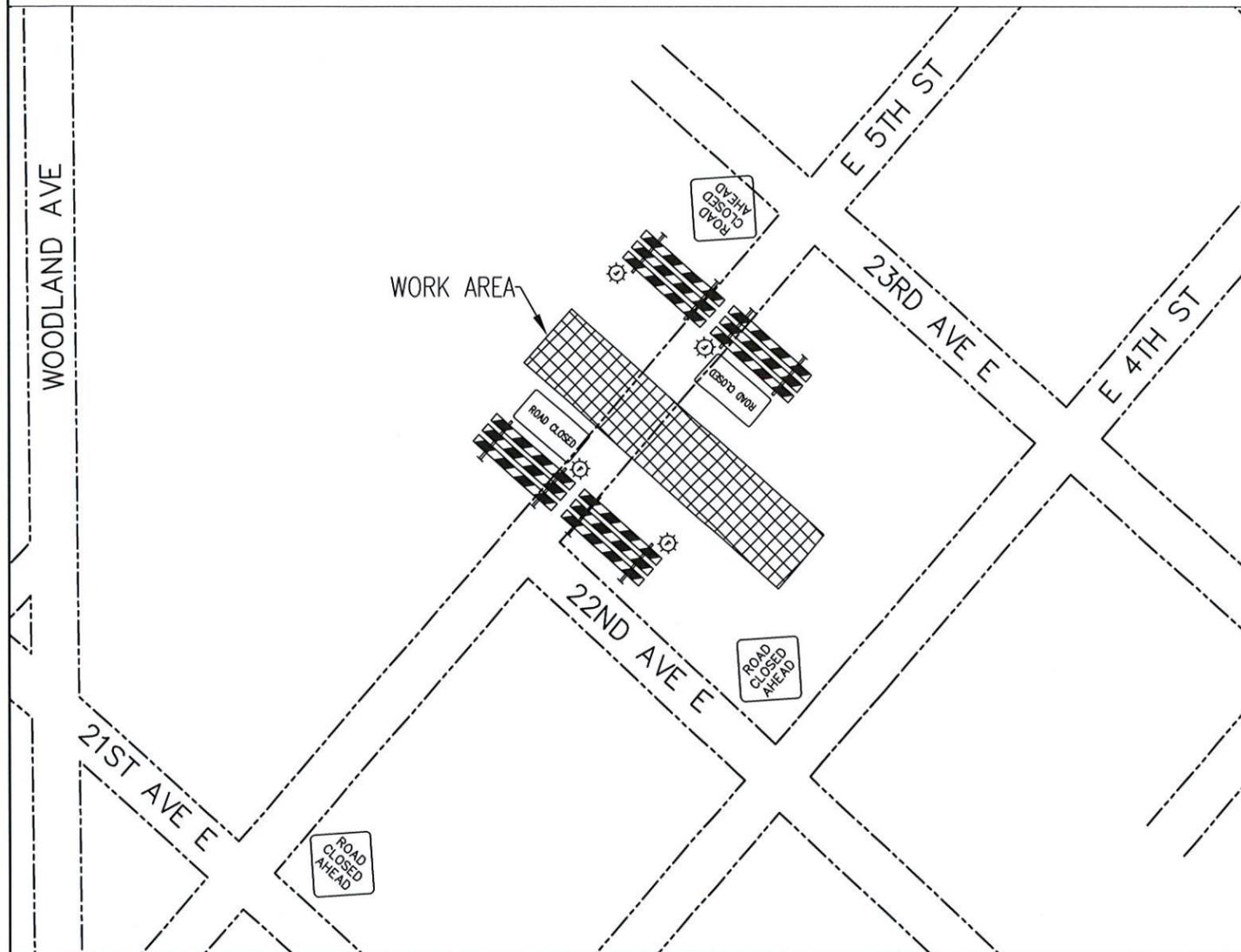
STATE AID PROJECT NO.: NA

DRAWN BY: JJM

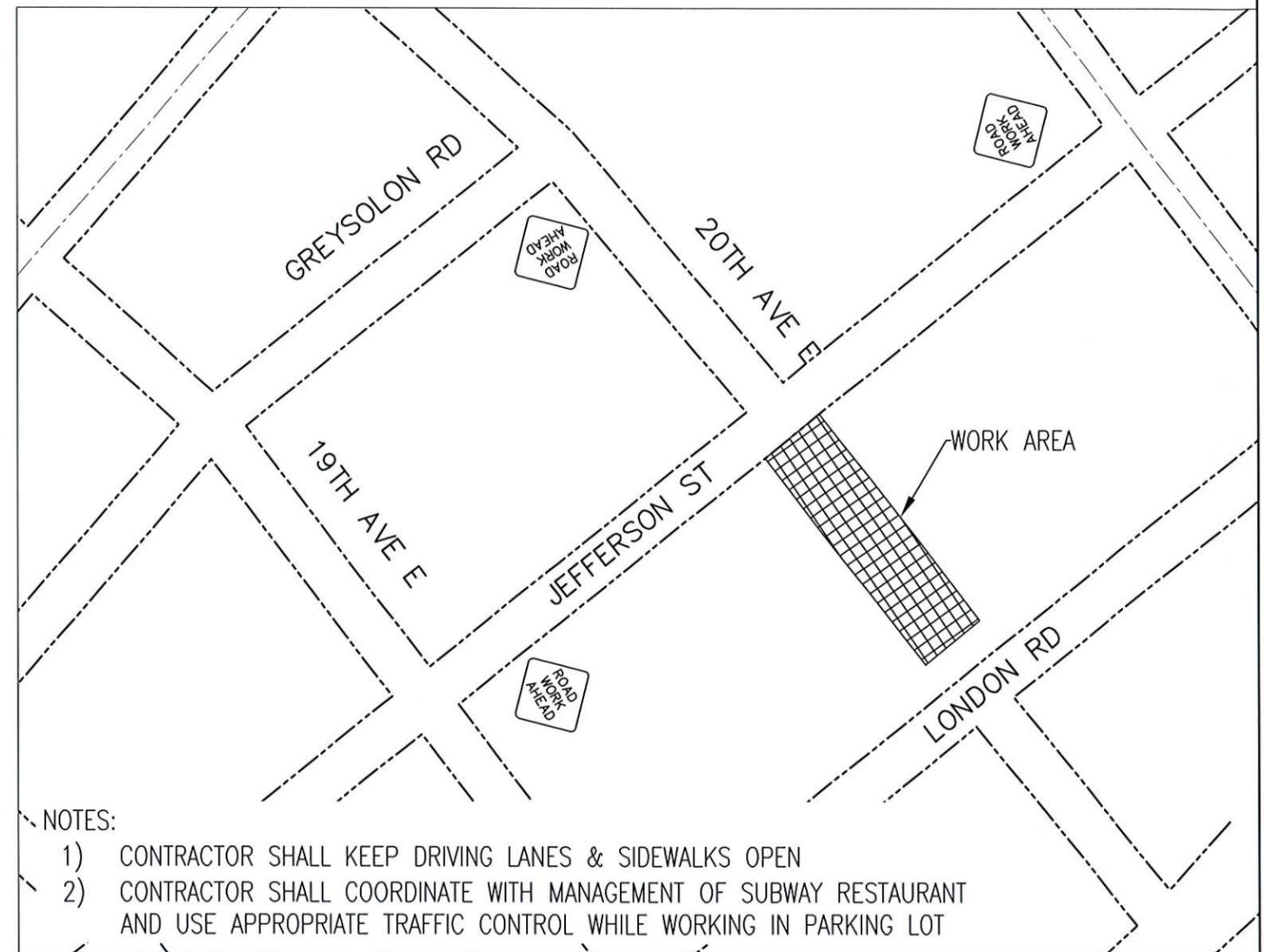
TRAFFIC CONTROL PLAN 1

SHEET NO. 6 OF 16

SITE 3 – E 5TH ST
TRAFFIC CONTROL PLAN



SITE 4 – JEFFERSON ST
TRAFFIC CONTROL PLAN



NOTES:

- 1) CONTRACTOR SHALL KEEP DRIVING LANES & SIDEWALKS OPEN
- 2) CONTRACTOR SHALL COORDINATE WITH MANAGEMENT OF SUBWAY RESTAURANT AND USE APPROPRIATE TRAFFIC CONTROL WHILE WORKING IN PARKING LOT

GENERAL TRAFFIC CONTROL NOTES:

1. THE CONTRACTOR SHALL FURNISH, INSTALL, ADJUST, MAINTAIN AND REMOVE ALL NECESSARY TRAFFIC CONTROL SIGNS AND DEVICES IN THIS TRAFFIC CONTROL PLAN.
2. ALL TRAFFIC CONTROL DEVICES AND SIGNS SHALL CONFORM TO THE CURRENT MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES INCLUDING "TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS".
3. FIELD CONDITIONS MAY REQUIRE MODIFICATIONS OF THIS LAYOUT AS DEEMED NECESSARY BY THE ENGINEER.
4. ADDITIONAL SIGNS AND TRAFFIC CONTROL DEVICES OR ALTERNATE LAYOUTS MAY BE NECESSARY DEPENDING ON THE TYPE AND SEQUENCE OF THE CONTRACTORS OPERATION. ALL CHANGES TO THE TRAFFIC CONTROL PLAN MUST BE APPROVED BY THE ENGINEER. NO ADDITIONAL COMPENSATION WILL BE MADE FOR CHANGES RESULTING FROM THE CONTRACTOR'S OPERATIONS
5. THE CONTRACTOR SHALL RECEIVE COMPENSATION FOR ALL NECESSARY TRAFFIC CONTROL WORK, WHETHER SHOWN IN THIS PLAN OR OTHERWISE, ON THE BASIS OF A LUMP SUM PAYMENT FOR ITEM TRAFFIC CONTROL (2563.601).
6. ALL DISTANCES AND SIGN PLACEMENT ARE APPROXIMATE AND SHALL BE FIELD ADJUSTED FOR SITE CONDITIONS.
7. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ANY WORK AREAS NEAR TRAFFIC IN ACCORDANCE WITH MMUTCD.
8. ALL DEVICES SHALL BE MOVED OR COVERED AS SOON AS THEY ARE NO LONGER REQUIRED OR APPROPRIATE.
9. THE CONTRACTOR SHALL PLACE PEDESTRIAN TRAFFIC CONTROL DEVICES AND DETOURS IF SIDEWALKS MUST BE BLOCKED. THE CONTRACTOR SHALL BE MINDFUL OF AND ACCOMMODATE PEDESTRIANS USING OPEN SIDEWALKS DURING CONSTRUCTION ACTIVITIES.

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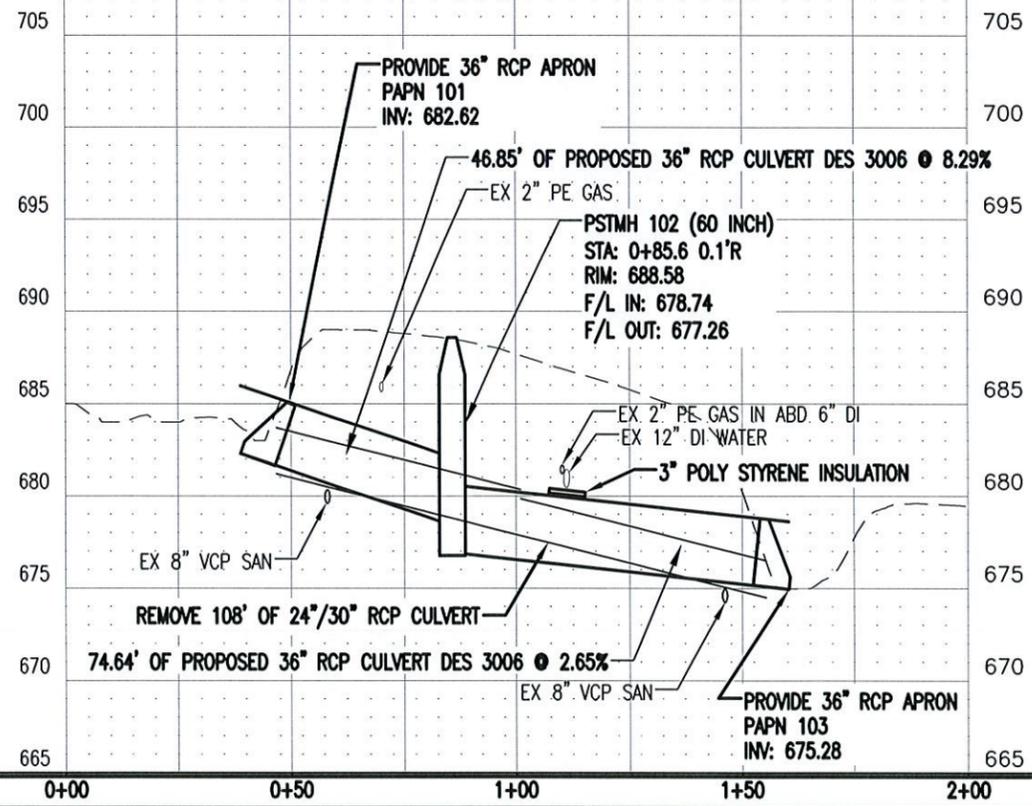
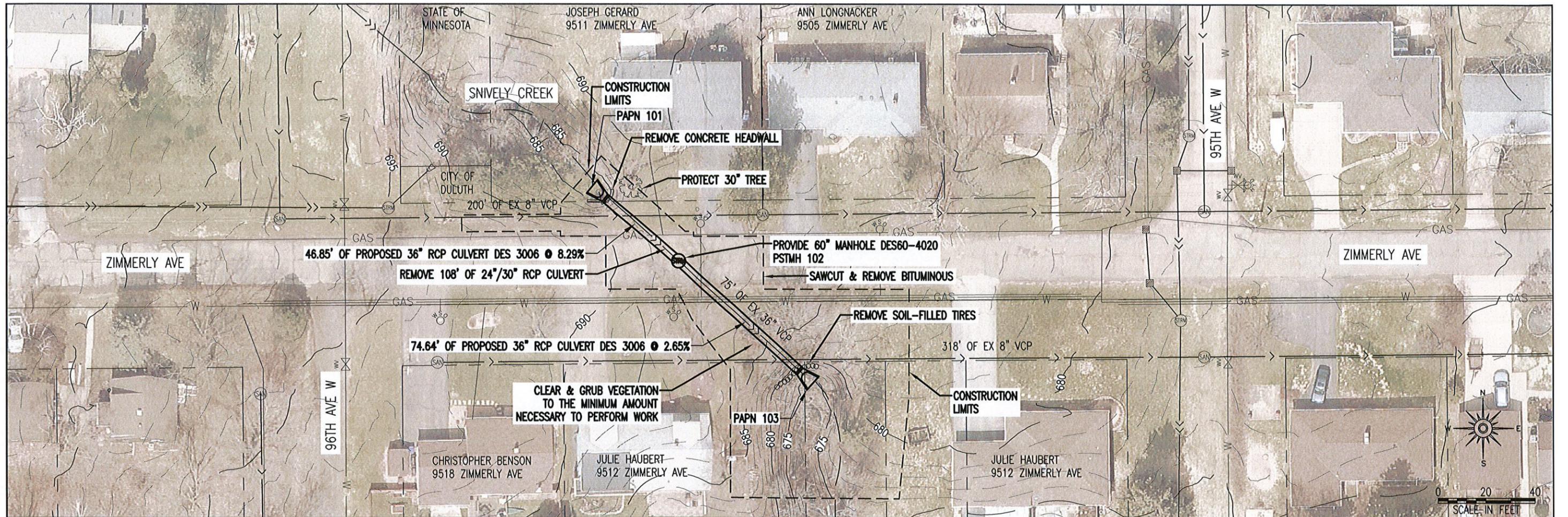
CITY PROJECT NO.: 1638

STATE AID PROJECT NO.: NA

DRAWN BY: JJM

TRAFFIC CONTROL PLAN 2

SHEET NO. 7 OF 16

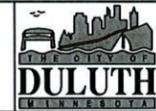


I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNATURE: *Thomas M. Pfeffer*

THOMAS M PFEFFER
TYPE NAME

DATE: 6/13/2017
LIC. NO.: 22442



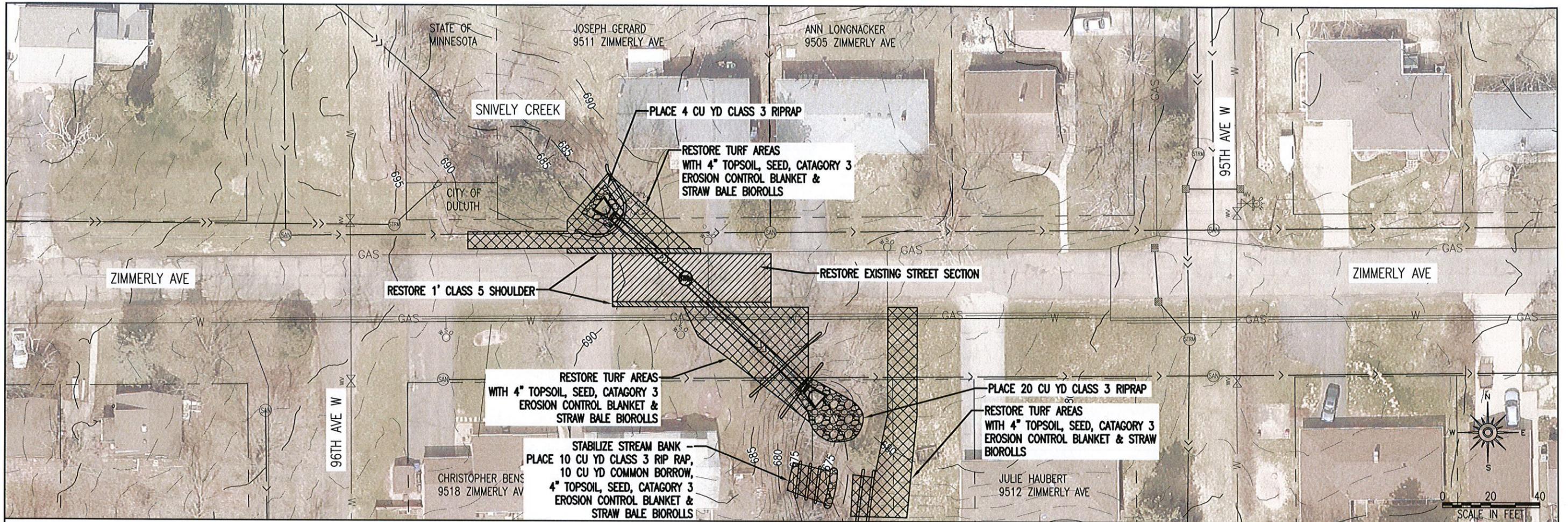
CITY OF DULUTH
ENGINEERING DIVISION
411 W. 1ST ST. STE. 211
DULUTH, MN 55802

2017 BWSR SEDIMENT REDUCTION PROJECTS

CITY PROJECT NO.: 1638

STATE AID PROJECT NO.: NA

DRAWN BY: JJM
SITE 1 - ZIMMERLY AVE PLAN & PROFILE
SHEET NO. 8 OF 16



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.

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TYPE NAME

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CITY OF DULUTH
ENGINEERING DIVISION
411 W. 1ST ST. STE. 211
DULUTH, MN 55802

2017 BWSR SEDIMENT REDUCTION PROJECTS

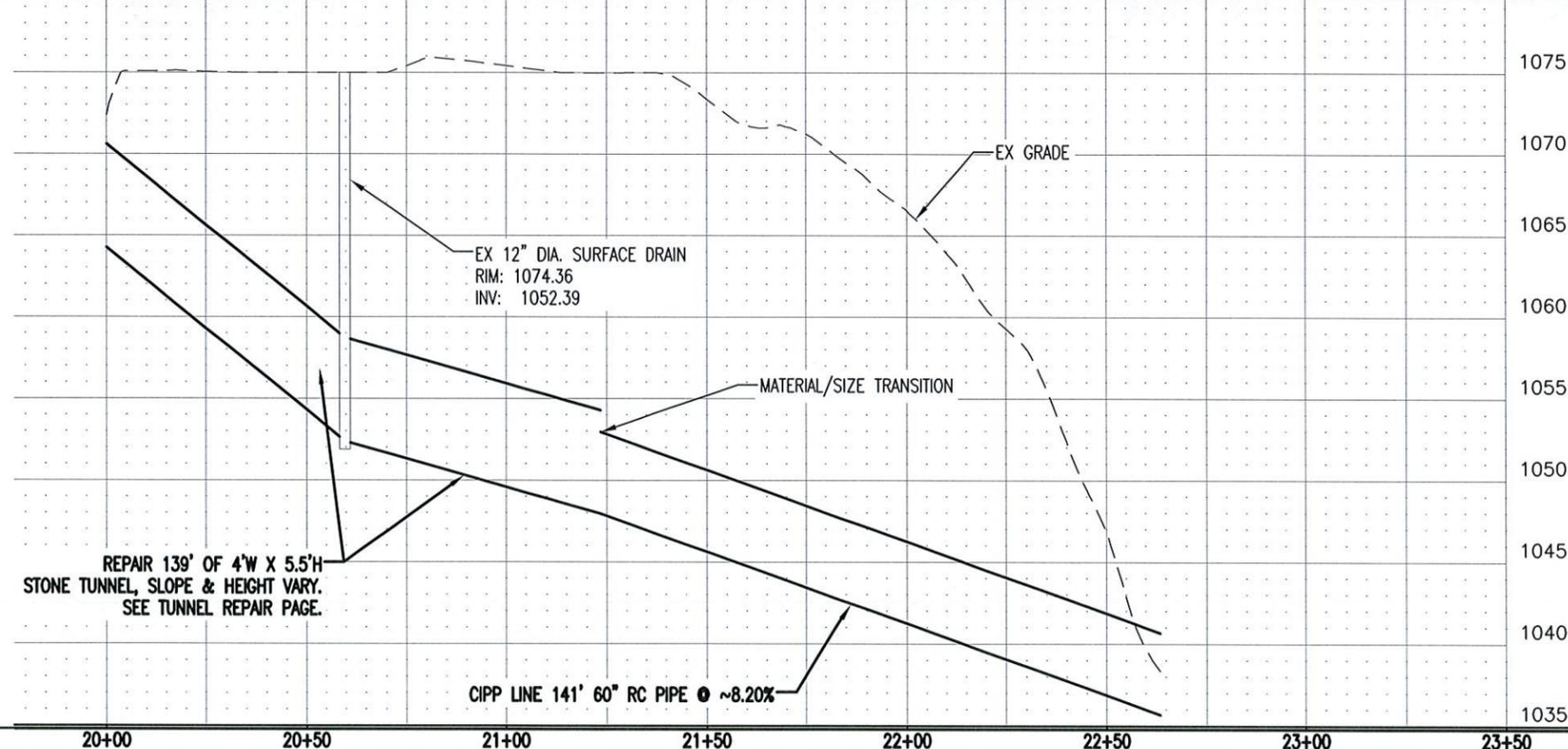
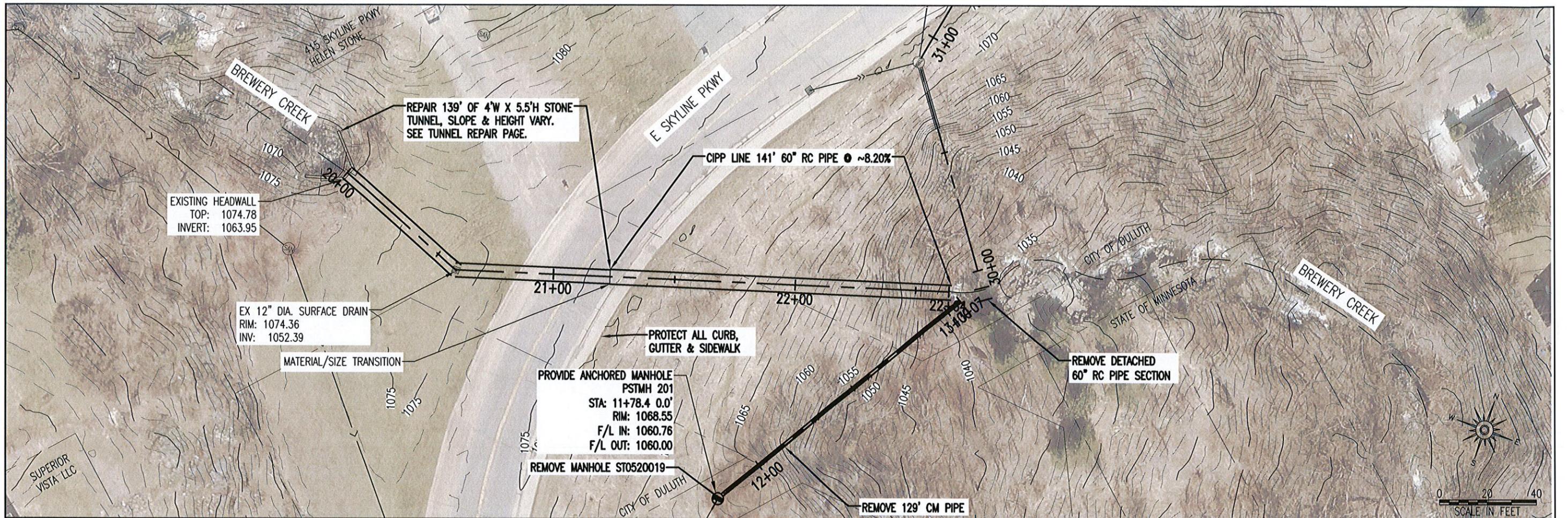
CITY PROJECT NO.: 1638

STATE AID PROJECT NO.: NA

DRAWN BY: JJM

SITE 1 - ZIMMERLY AVE RESTORATION

SHEET NO. 9 OF 16



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.

SIGNATURE: *Thomas M. Pfeffer*

THOMAS M PFEFFER
TYPE NAME

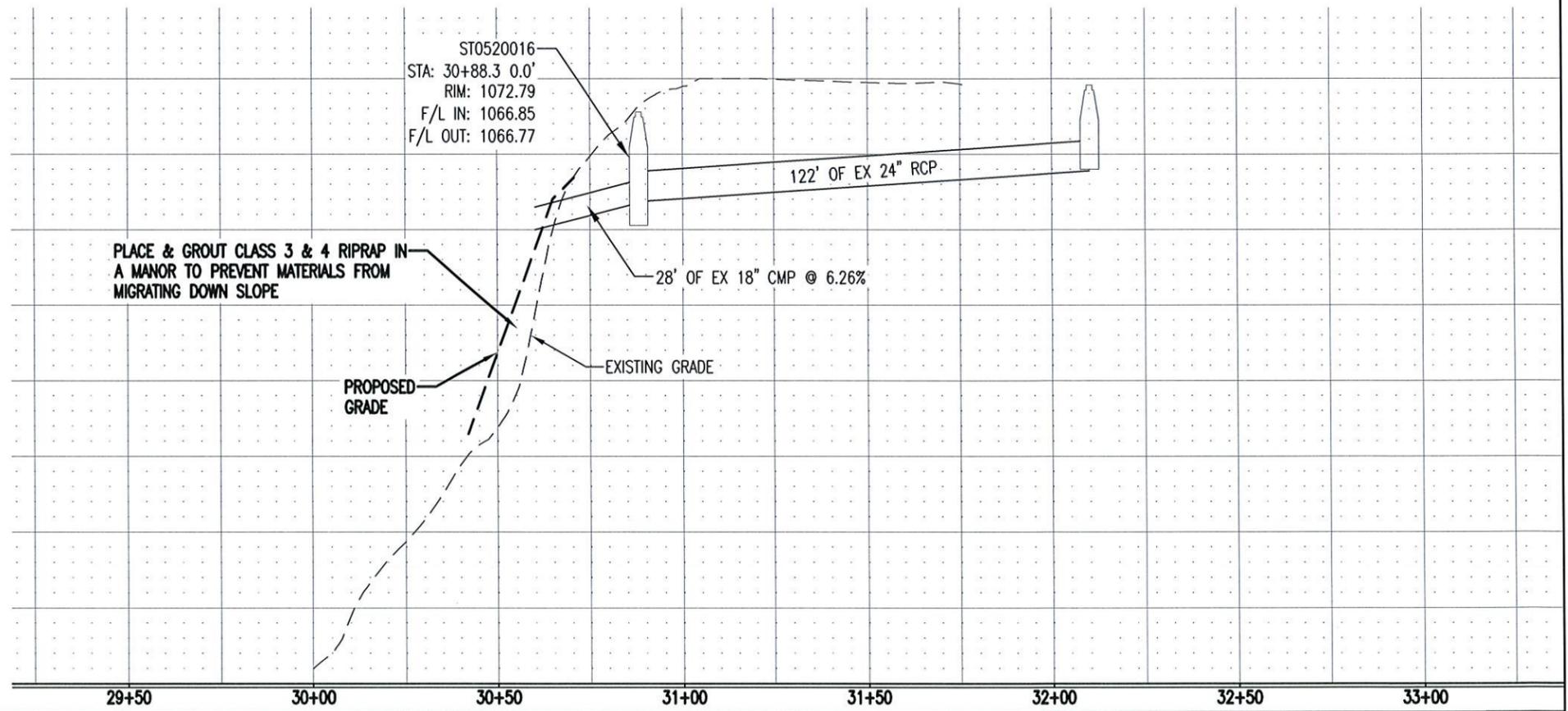
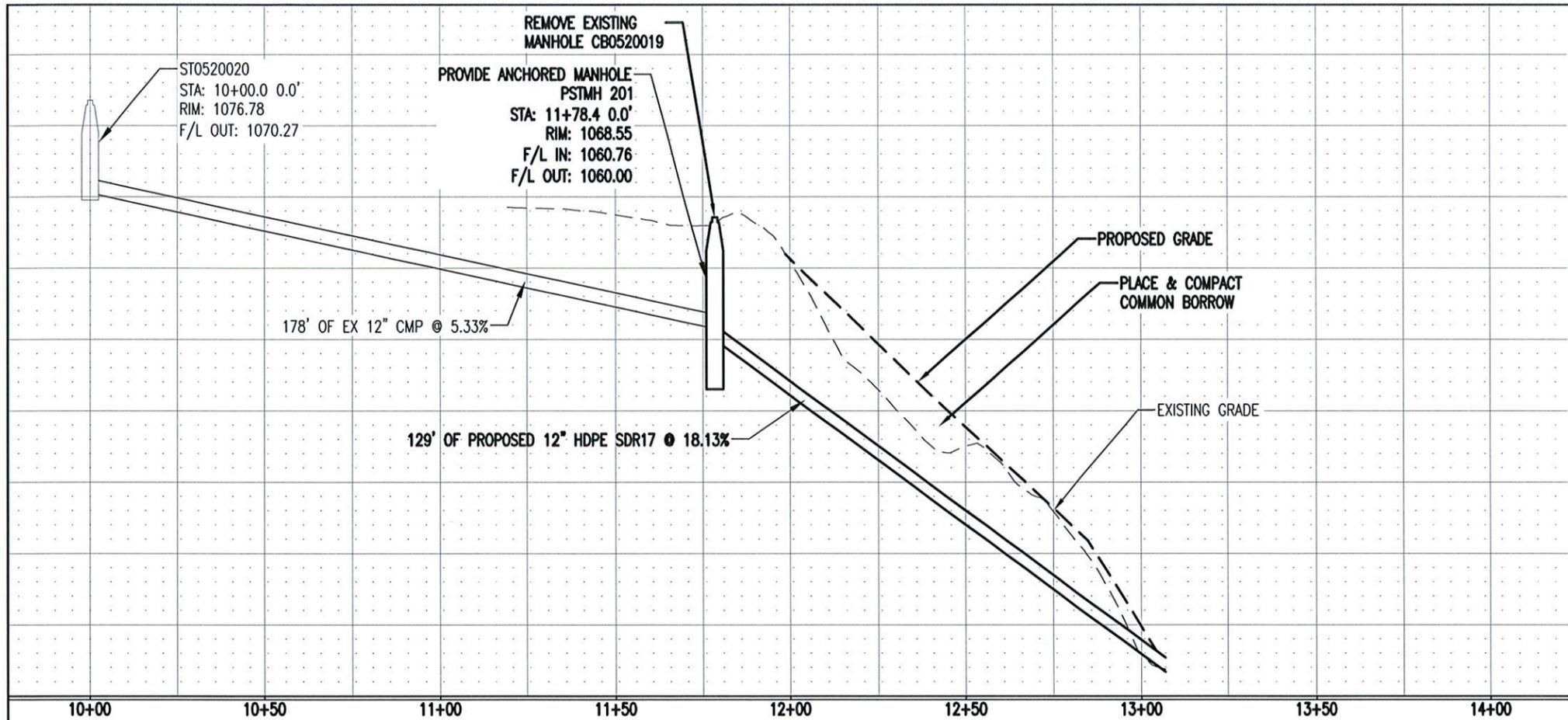
DATE: 6/13/2017
LIC. NO.: 22442

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411 W. 1ST ST. STE. 211
DULUTH, MN 55802

2017 BWSR SEDIMENT REDUCTION PROJECTS

CITY PROJECT NO.: 1638
STATE AID PROJECT NO.: NA

DRAWN BY: JIM
SITE 2 - SKYLINE PKWY PLAN & PROFILE
SHEET NO. 10 OF 16



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.

SIGNATURE: Thomas M. Pfeffer

THOMAS M PFEFFER
TYPE NAME

DATE: 6/13/2017

LIC. NO: 22442

 CITY OF DULUTH
ENGINEERING DIVISION
411 W. 1ST ST. STE. 211
DULUTH, MN 55802

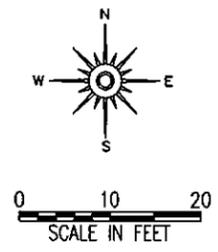
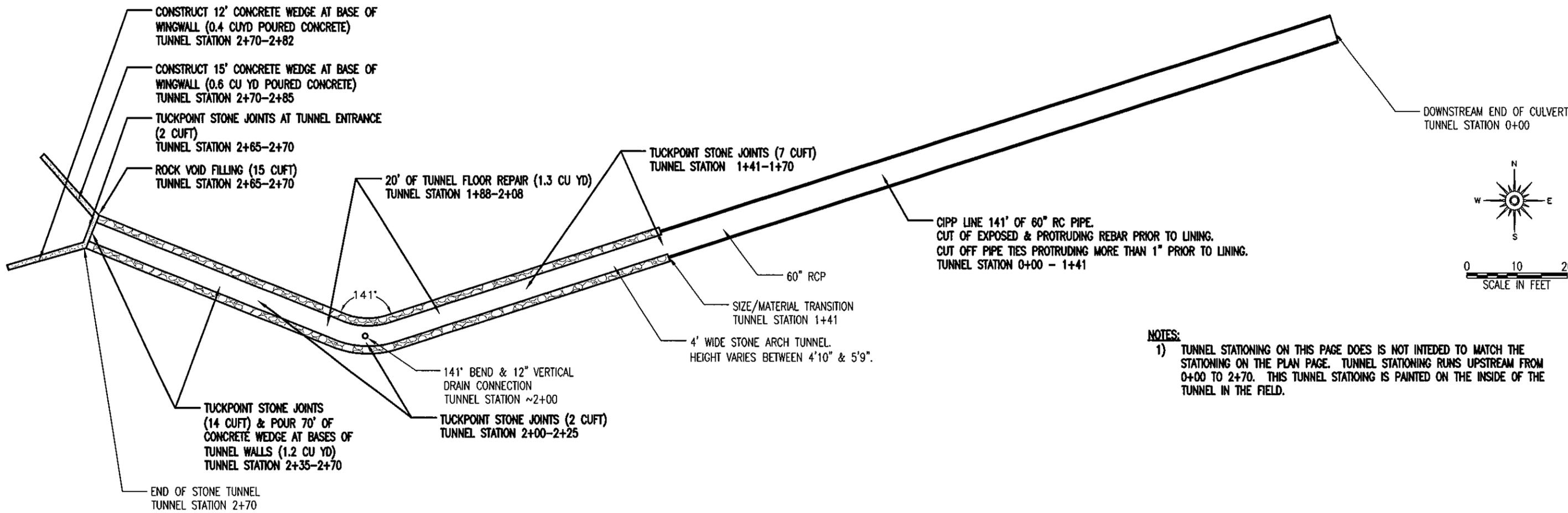
2017 BWSR SEDIMENT REDUCTION PROJECTS

CITY PROJECT NO.: 1638 STATE AID PROJECT NO.: NA

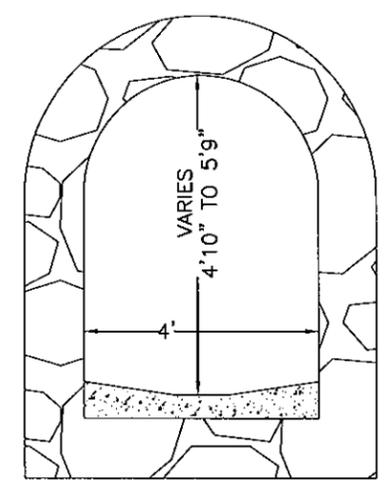
DRAWN BY: JJM

SITE 2 - SKYLINE PKWY PROFILES

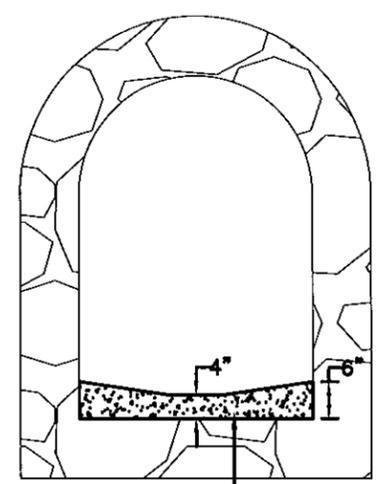
SHEET NO. 11 OF 16



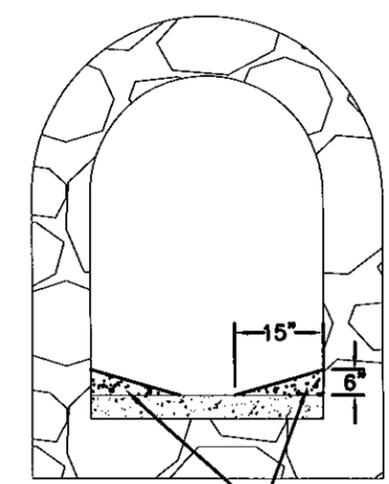
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 1) TUNNEL STATIONING ON THIS PAGE DOES NOT INTENDED TO MATCH THE STATIONING ON THE PLAN PAGE. TUNNEL STATIONING RUNS UPSTREAM FROM 0+00 TO 2+70. THIS TUNNEL STATIONING IS PAINTED ON THE INSIDE OF THE TUNNEL IN THE FIELD.



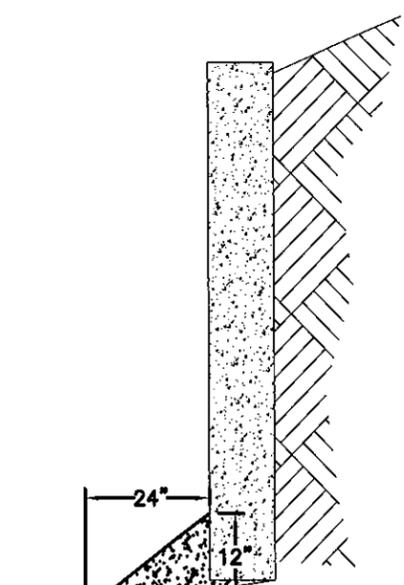
EXISTING STONE TUNNEL SECTION



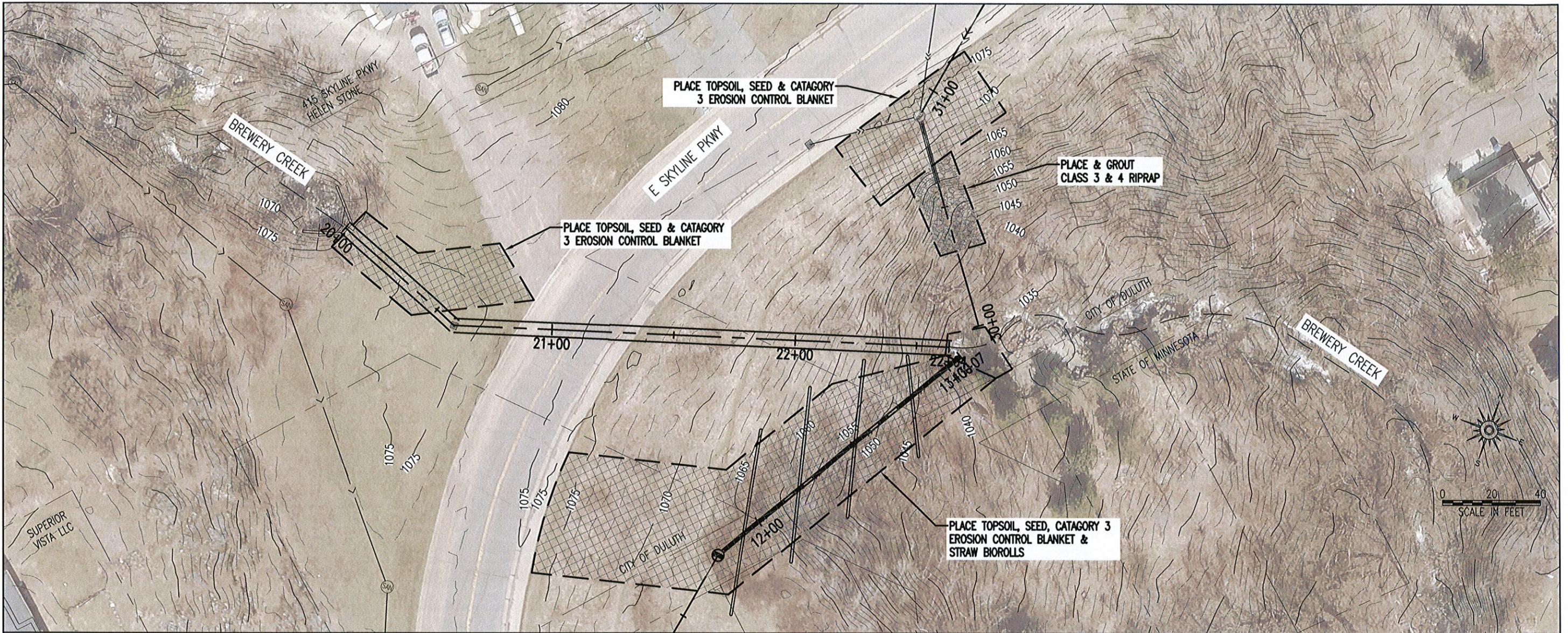
TUNNEL FLOOR REPAIR SECTION



CONCRETE WEDGE IN TUNNEL SECTION



CONCRETE WEDGE ON WINGWALL SECTION



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SIGNATURE: Thomas M. Pfeffer

THOMAS M PFEFFER
TYPE NAME

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411 W. 1ST ST. STE. 211
DULUTH, MN 55802

2017 BWSR SEDIMENT REDUCTION PROJECTS

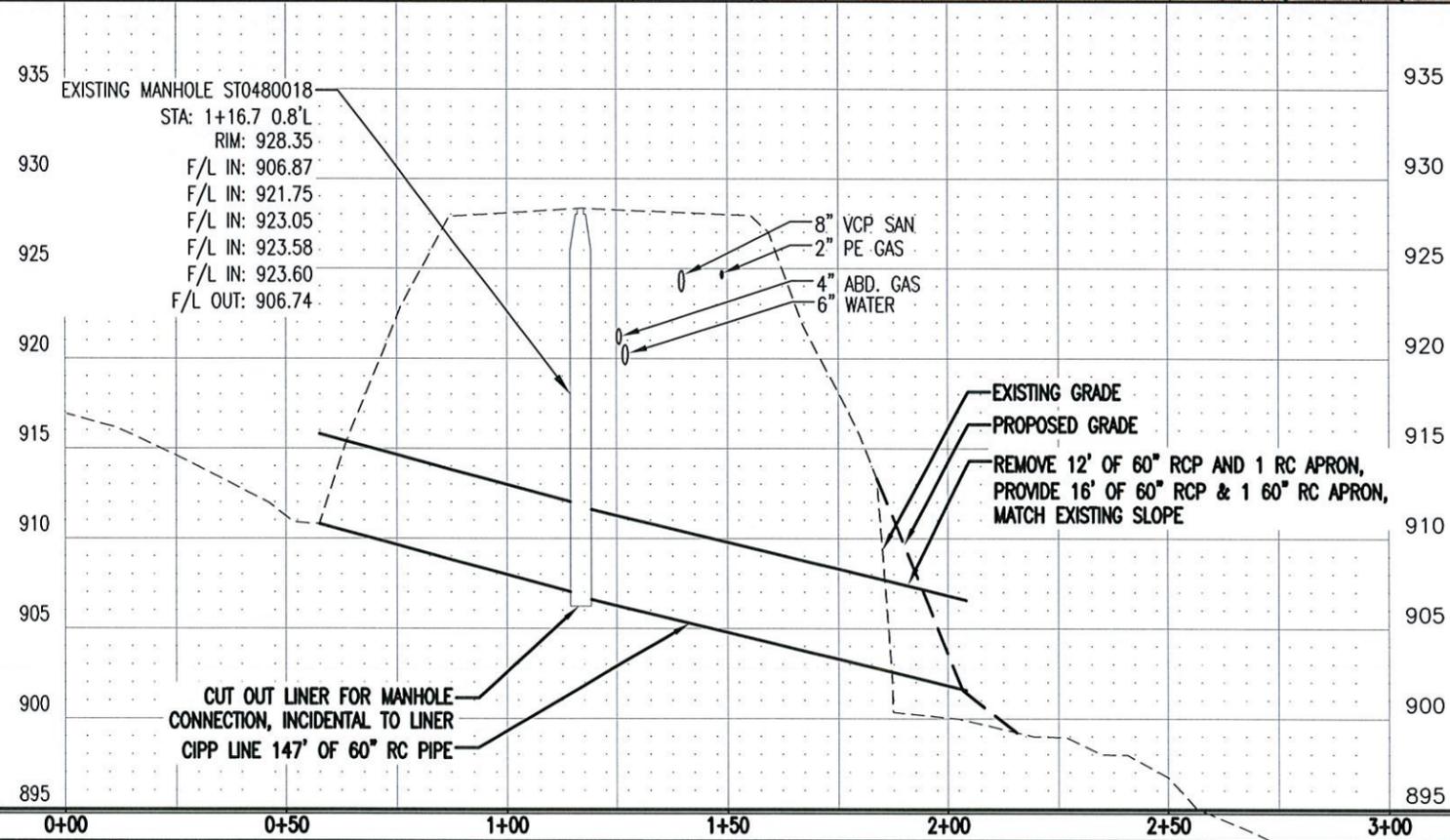
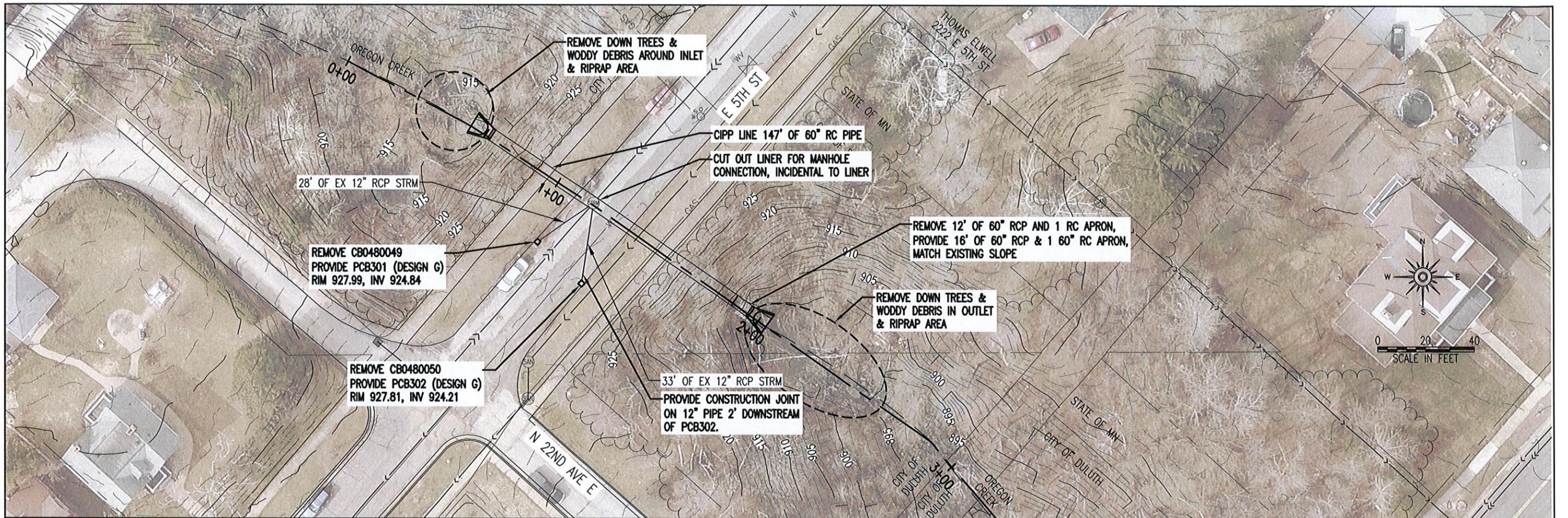
CITY PROJECT NO.: 1638

STATE AID PROJECT NO.: NA

DRAWN BY: JJM

SITE 2 - SKYLINE PKWY RESTORATION

SHEET NO. 13 OF 16



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.

SIGNATURE: Thomas M. Pfeffer

THOMAS M PFEFFER
TYPE NAME

DATE: 6/13/2017

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DULUTH, MN 55802

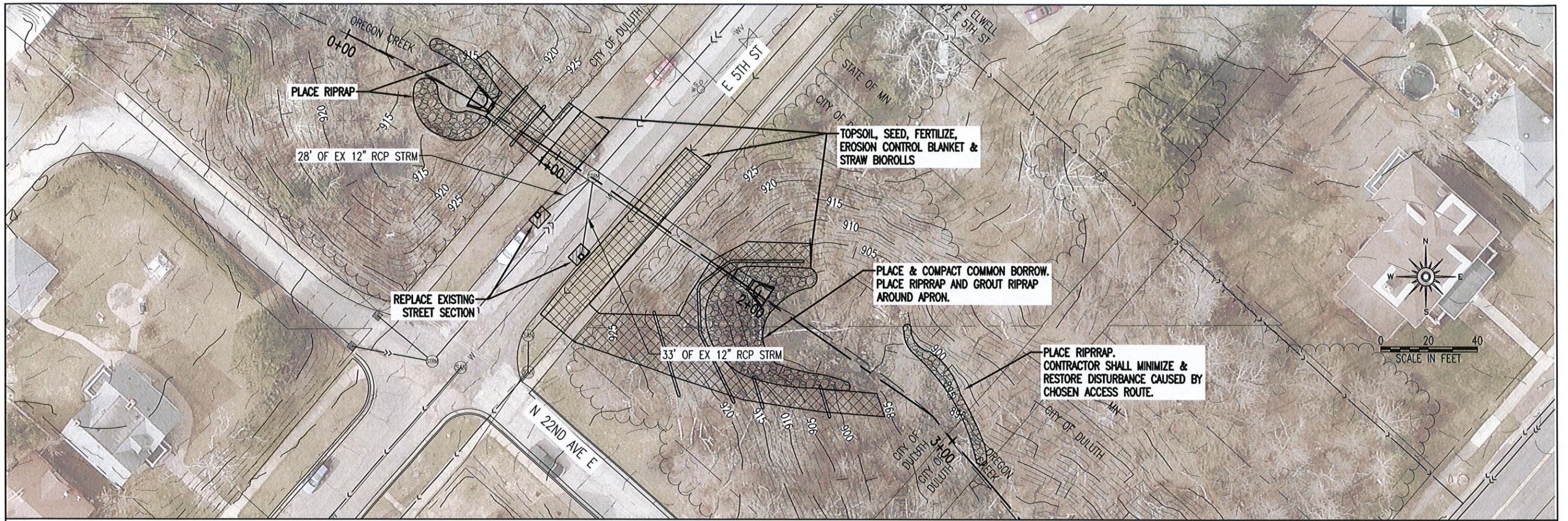
2017 BWSR SEDIMENT REDUCTION PROJECTS

CITY PROJECT NO.: 1638 STATE AID PROJECT NO.: NA

DRAWN BY: JJM

SITE 3 - E 5TH ST PLAN & PROFILE

SHEET NO. 14 OF 16



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.

SIGNATURE: Thomas M. Pfeiffer

THOMAS M PFEFFER
TYPE NAME

DATE: 6/13/2017

LIC. NO.: 22442



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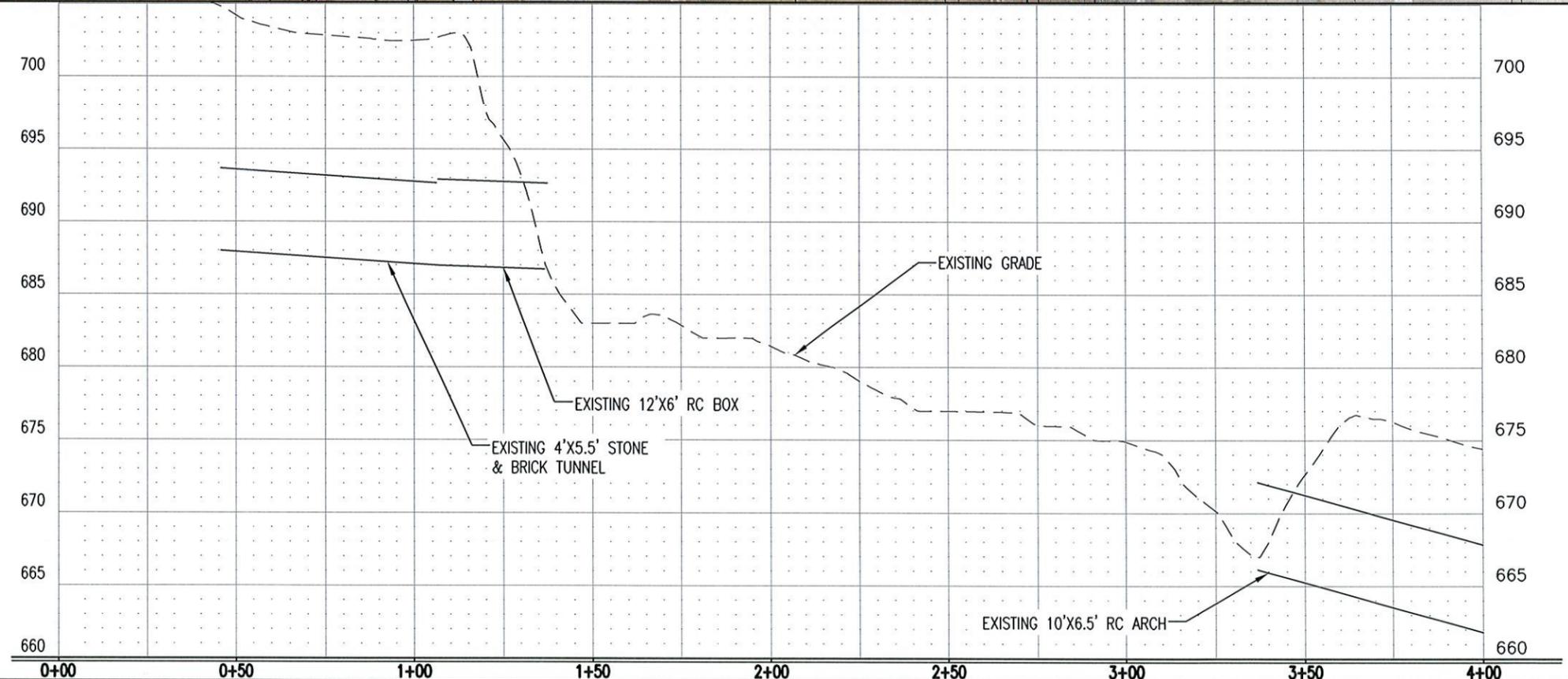
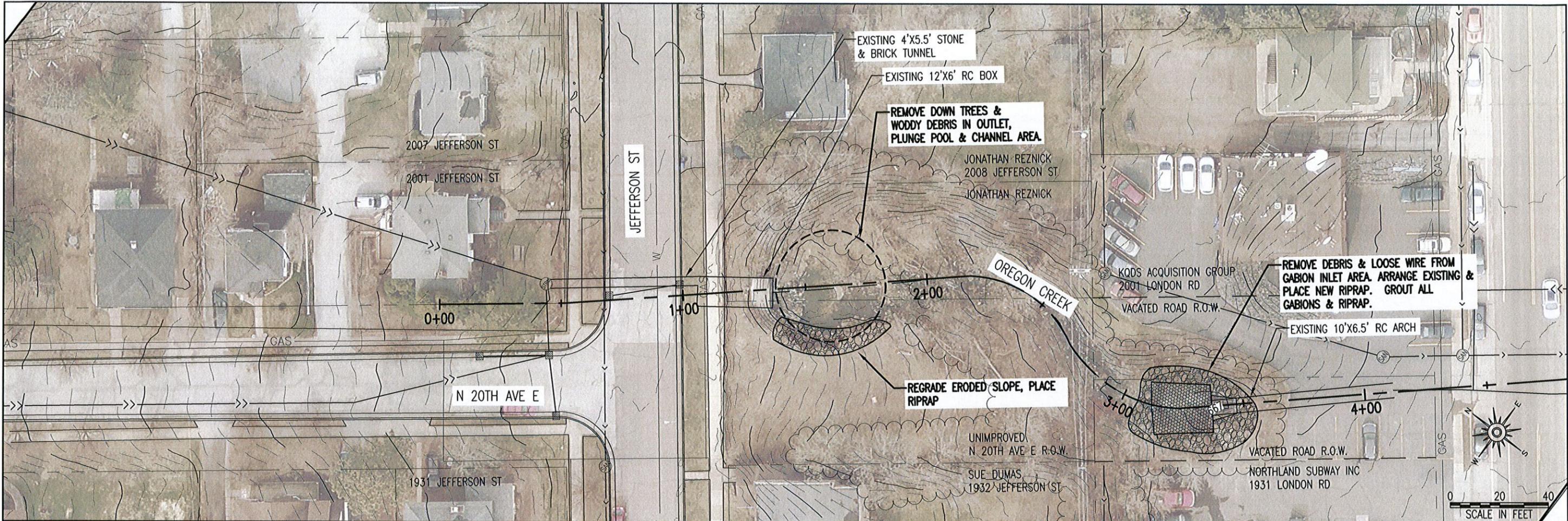
2017 BWSR SEDIMENT REDUCTION PROJECTS

CITY PROJECT NO.: 1638 STATE AID PROJECT NO.: NA

DRAWN BY: JJM

SITE 3 - E 5TH ST RESTORATION

SHEET NO. 15 OF 16



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.

SIGNATURE: Thomas M. Pfeffer

THOMAS M PFEFFER
TYPE NAME

DATE: 6/13/2017
LIC. NO.: 22442



CITY OF DULUTH
ENGINEERING DIVISION
411 W. 1ST ST. STE. 211
DULUTH, MN 55802

2017 BWSR SEDIMENT REDUCTION PROJECTS

CITY PROJECT NO.: 1638

STATE AID PROJECT NO.: NA

DRAWN BY: JJM
SITE 4 - JEFFERSON ST PLAN & RESTORATION
SHEET NO. 16 OF 16