

PLAN LEGEND

RIGHT OF WAY LINE	----
PR DITCH CENTERLINE	----
FENCE LINE	-x-x-
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

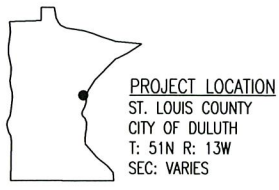
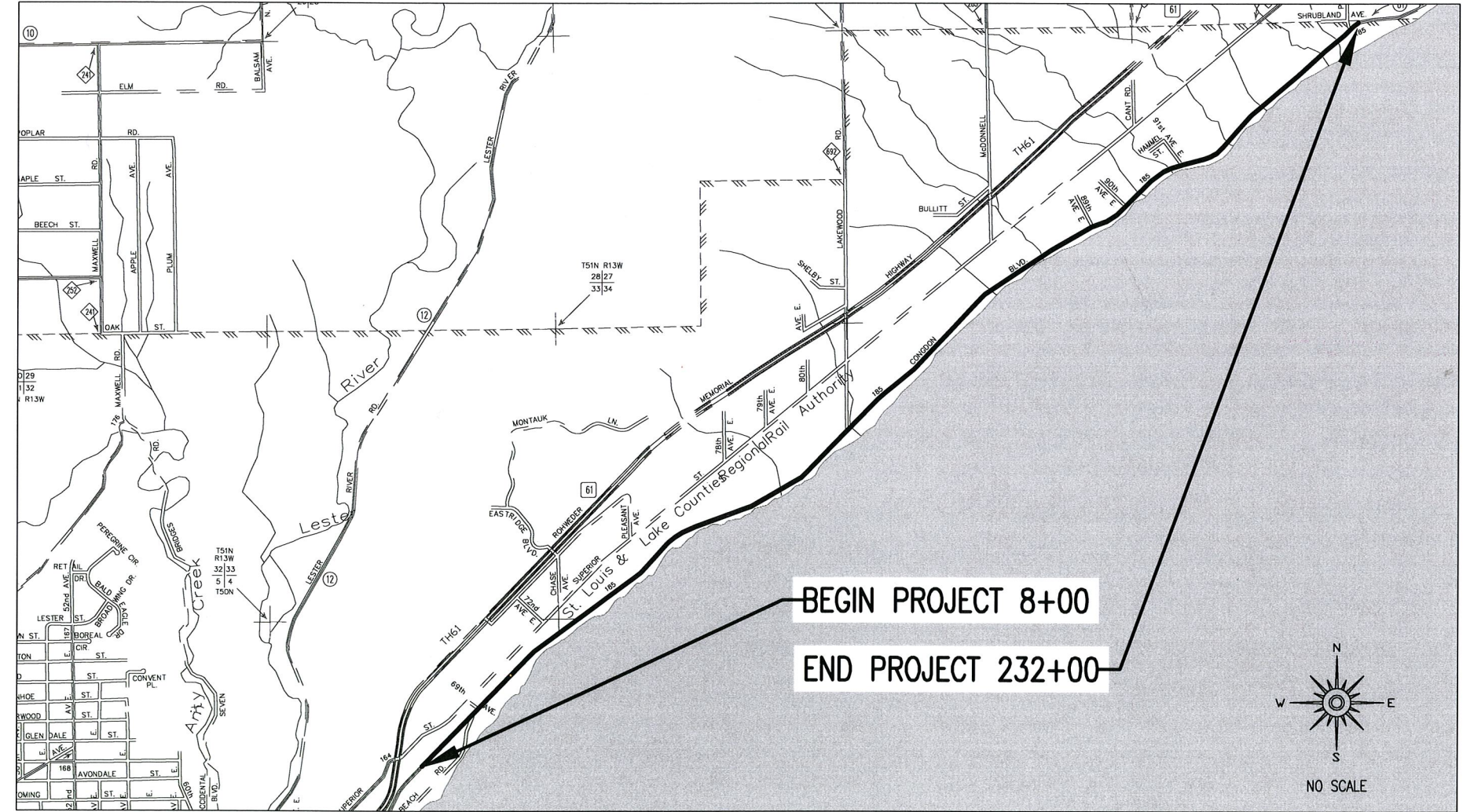
EX SANITARY MANHOLE	(SAN)
EX SANITARY CLEANOUT	(STRM)
EX STORM MANHOLE	(W)
EX STORM CATCHBASIN	(WV)
EX. WATER MANHOLE	(W&G)
EX. WATER VALVE	(GAS)
EX. WATER HYDRANT	(GV)
EX. WATER SHUTOFF	(S)
EX. WATER & GAS MH	(W&G)
EX. GAS MANHOLE	(GAS)
EX. GAS VALVE	(GV)
EX. GAS SHUTOFF	(S)
EX. STEAM MANHOLE	(STEAM)
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	(ET)
EX. STREET LIGHT	(SL)
EX. SIGNAL W/ STREET LIGHT	(H.H.)
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	(P)
EX. SOIL BORING	(SB#)

CITY OF DULUTH  
DEPARTMENT OF PUBLIC WORKS AND UTILITIES  
ENGINEERING DIVISION

CONSTRUCTION PLANS FOR:

CONGDON BOULEVARD CULVERT LINING AND REPLACEMENT (2016)  
FROM HIGHWAY 61 TO MCQUADE ROAD

CITY PROJECT NO. 1387



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 2016 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

ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO THE MN MUTCD,  
INCLUDING THE FIELD MANUAL DATED JANUARY 2014.  
AVAILABLE AT: <http://www.dot.state.mn.us/trafficeng/publ/mutcd/>

INDEX

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2	STATEMENT OF ESTIMATED QUANTITIES
3	PROJECT SITE OVERVIEW
4-5	STANDARD DETAILS
6-8	TRAFFIC CONTROL PLAN
9-39	CULVERT PLAN & PROFILES
40	SWPPP

THIS PLAN CONTAINS 40 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* 3-9-16 22442  
PROJECT ENGINEER DATE LIC. NO.

CITY APPROVAL  
*C. Peterson* 3/9/16  
APPROVED CHIEF ENGINEER OF TRANSPORTATION DATE

*BR* 3/9/16  
APPROVED CHIEF ENGINEER OF UTILITIES DATE  
*SK* 3/9/16  
APPROVED CITY ENGINEER DATE



SCHEDULE OF ESTIMATED QUANTITIES

LINE	NOTES	SPEC. NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY
1		2021.501	MOBILIZATION	LS	1
2	1,6	2101.511	CLEARING AND GRUBBING (P)	LS	1
3		2104.501	REMOVE CONCRETE CULVERT	LF	156
4	5	2104.505	REMOVE CONCRETE PAVEMENT	SY	156
5		2104.505	REMOVE BITUMINOUS PAVEMENT	SY	359
6		2104.509	REMOVE HEADWALL	EACH	1
7		2104.509	REMOVE CONCRETE APRON	EACH	8
8		2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LF	239
9	5	2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LF	72
10		2104.521	SALVAGE PIPE CULVERT	LF	42
11		2104.523	SALVAGE PIPE APRON	EACH	8
12	6	2104.601	REMOVE MISCELLANEOUS DEBRIS	LS	1
13		2105.523	COMMON BORROW (LV)	C Y	30
14	16	2105.603	DITCHING	LF	385
15		2211.503	AGGREGATE BASE (CV) CLASS 5	CY	129
16		2301.504	CONCRETE PAVEMENT 6"	SQ YD	156
17		2301.602	DRILL & GROUT REINF BAR (EPOXY COATED)	EACH	32
18	2	2360.501	TYPE SP 9.5 WEARING COURSE MIX (3,B)	TON	59
19	3	2360.502	TYPE SP 12.5 NON WEAR COURSE MIX (3,B)	TON	72
20	15	2411.601	DRILL & EPOXY REINF BAR FOOTING / APRON	LUMP SUM	1
21		2501.561	18" RCP PIPE CULVERT DES 3006 CL IV	LF	68
22		2501.511	24" RCP PIPE CULVERT CLASS III	LF	20
23		2501.561	30" RCP PIPE CULVERT DES 3006 CL III	LF	62
24		2501.511	36" RCP PIPE CULVERT CLASS III	LF	12
25		2501.515	18" RCP PIPE APRON	EACH	2
26		2501.515	24" RCP PIPE APRON	EACH	1
27		2501.515	30" RCP PIPE APRON	EACH	2
28		2501.515	36" RCP PIPE APRON	EACH	1
29	8	2501.571	INSTALL PIPE CULVERT (18" RCP)	LF	4
30	8	2501.571	INSTALL PIPE CULVERT (24" RCP)	LF	24
31	8	2501.571	INSTALL PIPE CULVERT (36" RCP)	LF	6
32	8	2501.571	INSTALL PIPE CULVERT (42" RCP)	LF	8
33	8	2501.573	INSTALL PIPE APRON	EACH	8
34		2501.603	REPAIR CULVERT JOINT	LF	45
35		2503.602	REMOTE CUT AND RECONNECT SERVICE	EACH	1
36		2503.602	CONSTRUCTION JOINT, 36" RC PIPE	EACH	1
37		2503.602	CONSTRUCTION JOINT, 42" RC PIPE	EACH	1
38		2503.603	15" CIPP LINER STORM CULVERT	LF	255
39		2503.603	18" CIPP LINER STORM CULVERT	LF	389
40		2503.603	24" CIPP LINER STORM CULVERT	LF	684
41		2503.603	30" CIPP LINER STORM CULVERT	LF	183
42		2503.603	36" CIPP LINER STORM CULVERT	LF	410
43		2503.603	42" CIPP LINER STORM CULVERT	LF	572
44		2503.603	48" CIPP LINER STORM CULVERT	LF	379
45		2503.603	60" CIPP LINER STORM CULVERT	LF	136
46		2503.603	60" X 48" CIPP LINER STORM CULVERT	LF	72
47		2504.604	3" POLYSTYRENE INSULATION	SQ YD	7
48	4,9	2511.501	RANDOM RIPRAP CLASS III	CY	135
49	4,9	2511.501	RANDOM RIPRAP CLASS IV	CY	105
50	7	2554.603	SALVAGE & INSTALL GUARDRAIL	LF	75
51	14	2563.601	TRAFFIC CONTROL	LS	1
52		2573.533	SEDIMENT CONTROL LOG TYPE STRAW	LF	250
53	10	2574.508	FERTILIZER TYPE 3	POUND	102
54		2574.525	COMMON TOPSOIL BORROW (LV)	CY	29
55		2575.501	SEEDING	ACRE	0.45
56	11	2575.502	SEED MIXTURE 25-141	POUND	38
57		2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	2121
58	12	2582.502	4" SOLID LINE PAINT	LF	156
59	13	2582.502	4" DBLE SOLID LINE PAINT	LF	78

NOTES:

- 1) ITEM SHALL INCUDE ALL CLEARING AND GRUBBING NECESSARY TO ACCOMPLISH THE PROPSD WORK INCLUDING, BUT NOT LIMITED TO, CLEARING AND GRUBBING NOTED ON PLAN PAGES. CLEARING FOR ACCESS ONLY SHALL BE A MINIMAL AMOUNT NECESSARY TO ACHIEVE ACCESS. THE REMOVAL ON ANY TREES GREATER THAN 6" DIAMETER SHALL BE APPROVED BY THE ENGINEER.
- 2) 3" THICKNESS PLACED IN 2 LIFTS.
- 3) 5.75" THICKNESS PLACED IN 3 LIFTS.
- 4) INCLUDES EXCAVATION, GRADE PREPARATION, GEOTEXTILE UDERLAYMENT, AND FURNISHING & PLACING RIPRAP.
- 5) REINFORCED CONCRETE.
- 6) ALL RESULTING DEBRIS SHALL BE REMOVED FROM SITE. INCULDES REMOVING BRUSH, STRUMPS, DOWNED TREES, BOULDERS AND SEDIMENT.
- 7) INCLUDES GUARDRAIL POSTS.
- 8) INSTALL SALVAGED CULVERT PIPE OR APRONS DEEMED SUITABLE BY THE ENGINEER.
- 9) RIPRAP SHALL MEET MNDOT GRADATION SPECIFICATIONS.
- 10) APPLIED AT A RATE OF 200 POUNDS PER ACRE. ANALYSIS 22-5-10.
- 11) APPLIED AT A RATE OF 61 POUNDS PER ACRE.
- 12) WHITE EDGE LINES.
- 13) YELLOW CENTER LINES.
- 14) INCLUDES MULTIPLE PHASE DETOUR SIGNAGE.
- 15) FOR PIPE APRON CONNECTION AT SITE 28.
- 16) INCLUDES REMOVING VEGETATION, ROCKS, AND SEDIMENT TO RE-ESTABLISH DRAINAGE DITCH.

MNDOT STANDARD PLATES

3000 L	REINFORCED CONCRETE PIPE
3006 G	GASKET JOINT FOR R.C. PIPE
3100 G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
3133 D	RIPRAP AT RCP OUTLETS
3145 G	CONCRETE PIPE OR PRECAST BOX CULVERT TIES

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SIGNATURE: Thomas M. Pfeiffer

THOMAS M. PFEFFER  
TYPE NAME

DATE: 3/8/2016

LIC. NO.: 22442



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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

STATE AID PROJECT NO.: NA

DRAWN BY: JJM

SEQ

SHEET NO. 2 OF 40

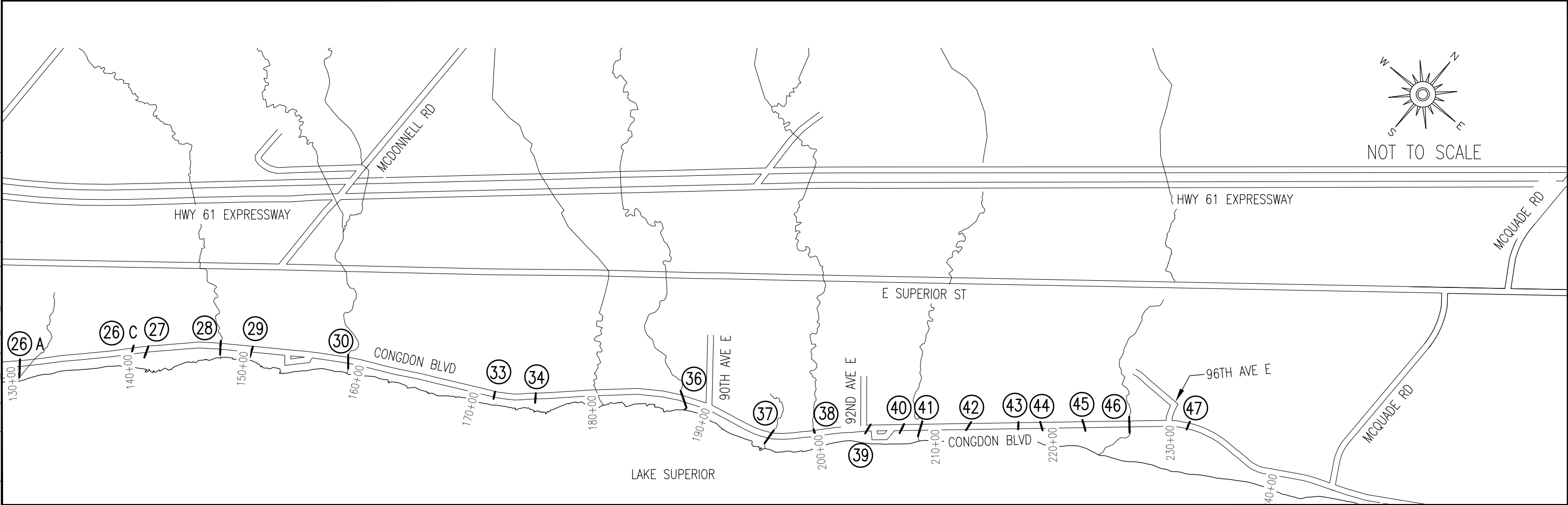
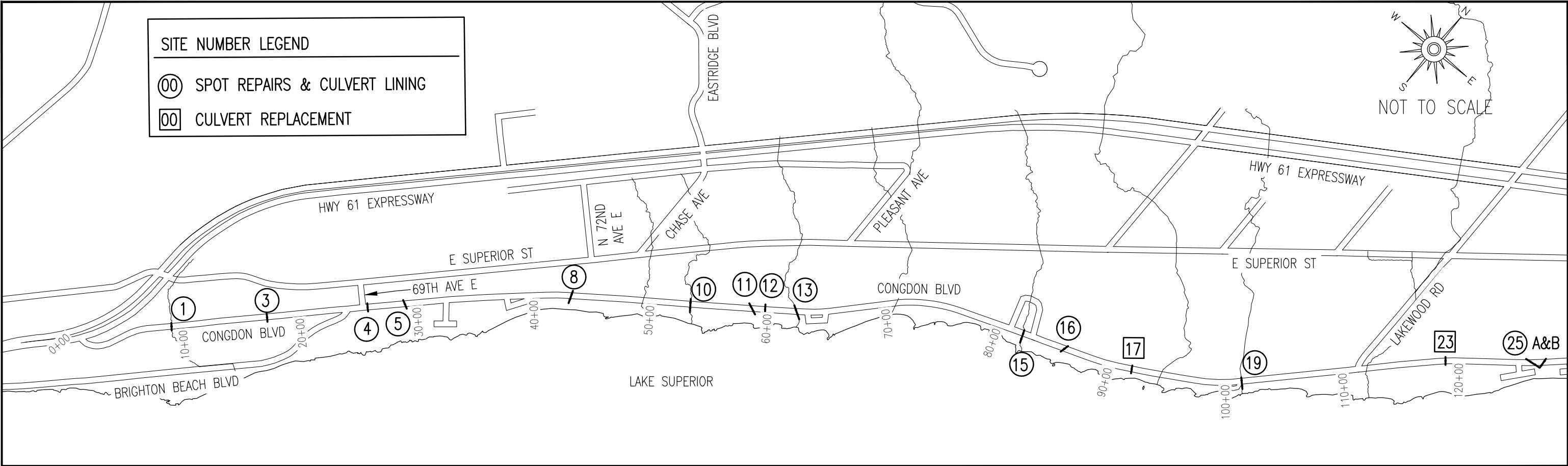
SITE NUMBER LEGEND

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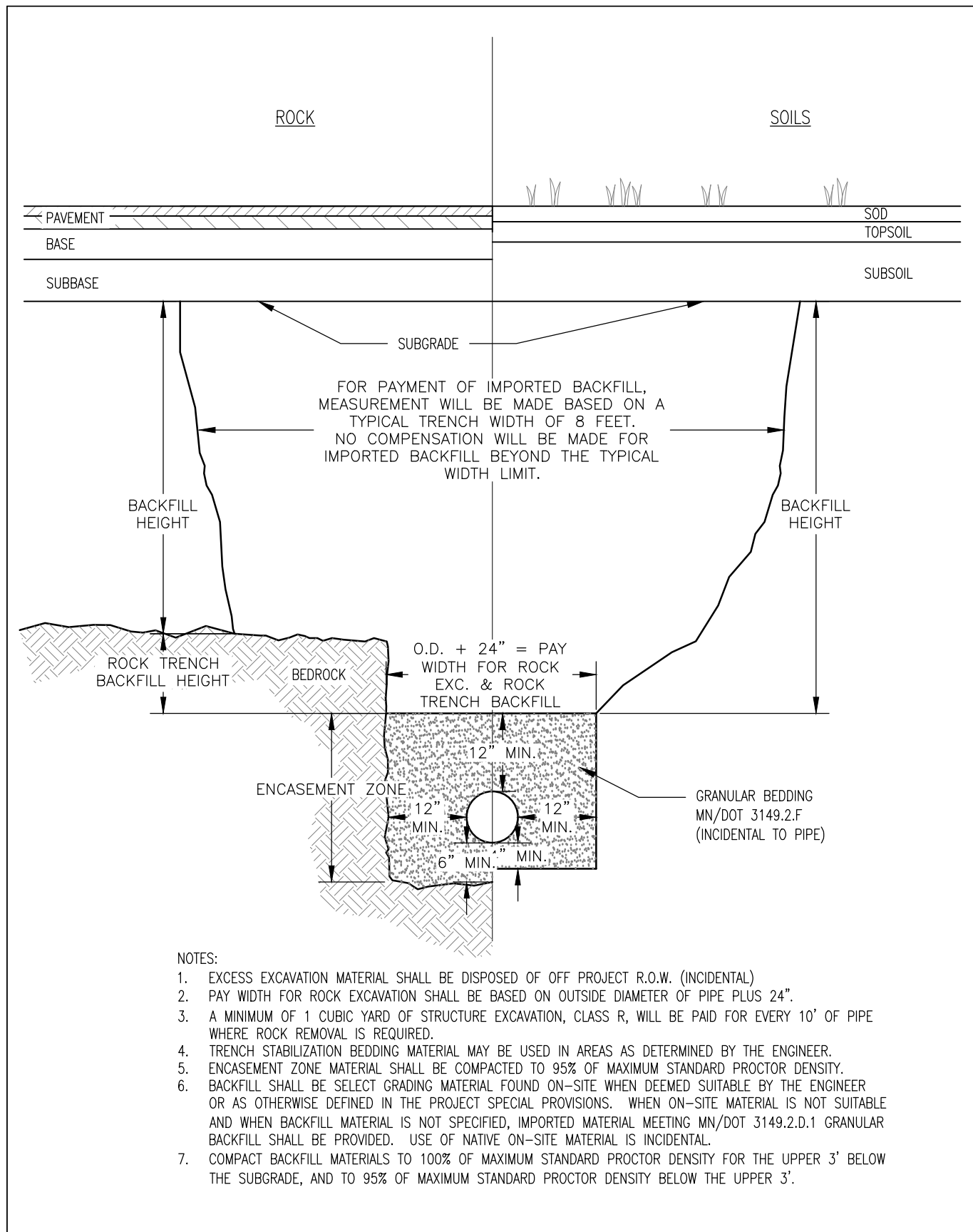
SPOT REPAIRS & CULVERT LINING

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CULVERT REPLACEMENT



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### CONCRETE STORM SEWER BEDDING

EX-4

REVISED/APPROVED 1/8/2016

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

NO SCALE

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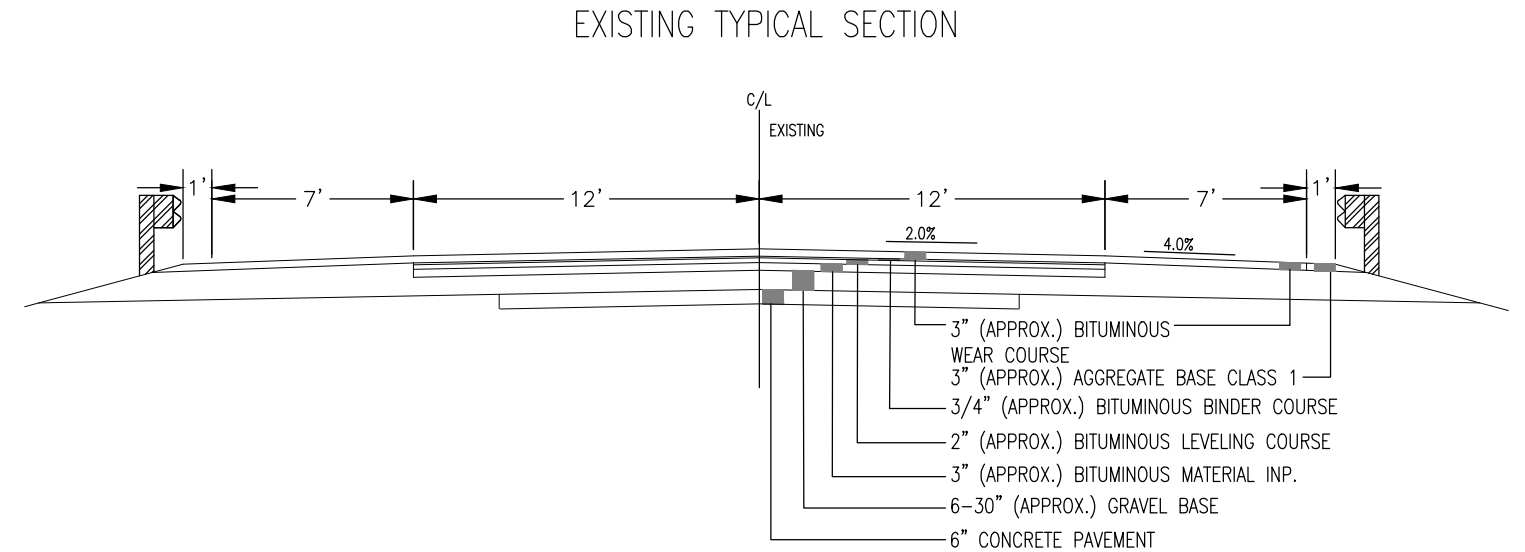


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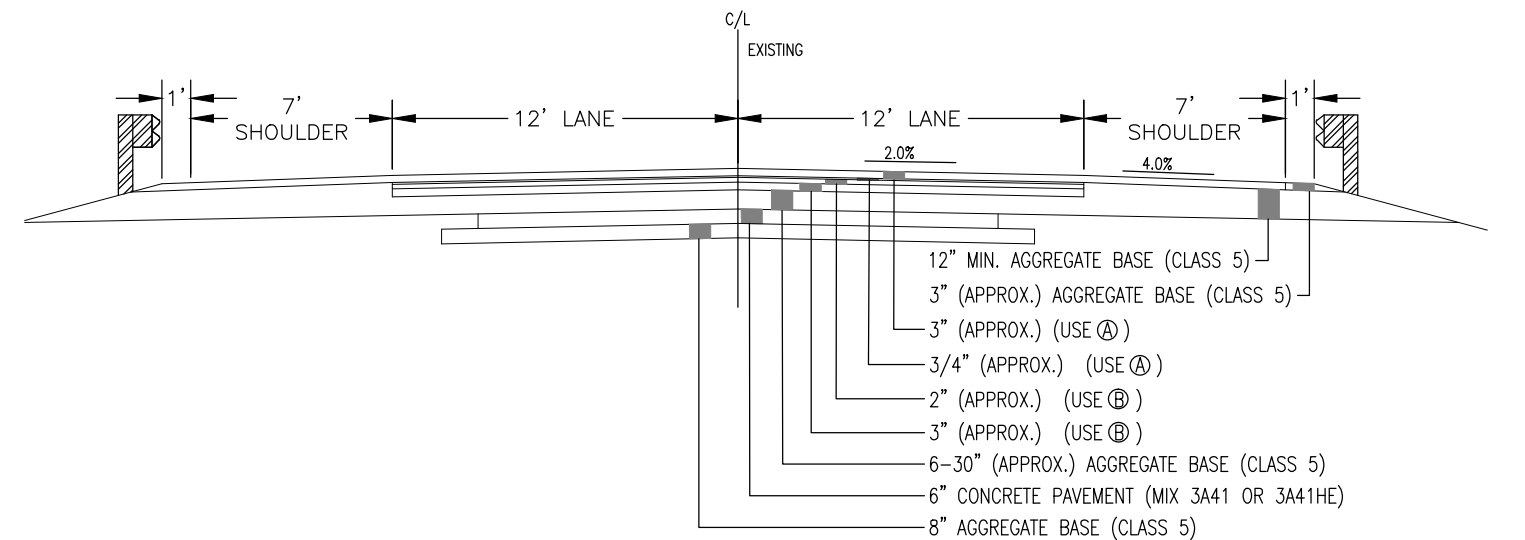
### PAVEMENT RESTORATION OF EXISTING TYPICAL SECTION

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

NO SCALE



### PROPOSED RESTORATION TYPICAL SECTION



ASPHALT MIXTURE DESIGNATION:

A SPWEA340B (PG 58S-28)

B SPNWB330B (PG 58S-28)

NOTES:

1. PROVIDE PAVEMENT STRUCTURE RESTORATION TO MATCH EXISTING EXCEPT AS NOTED ABOVE AND AS OTHERWISE DIRECTED BY ENGINEER.

DRAWN BY: JJM

DETAILS

SHEET NO. 4 OF 40

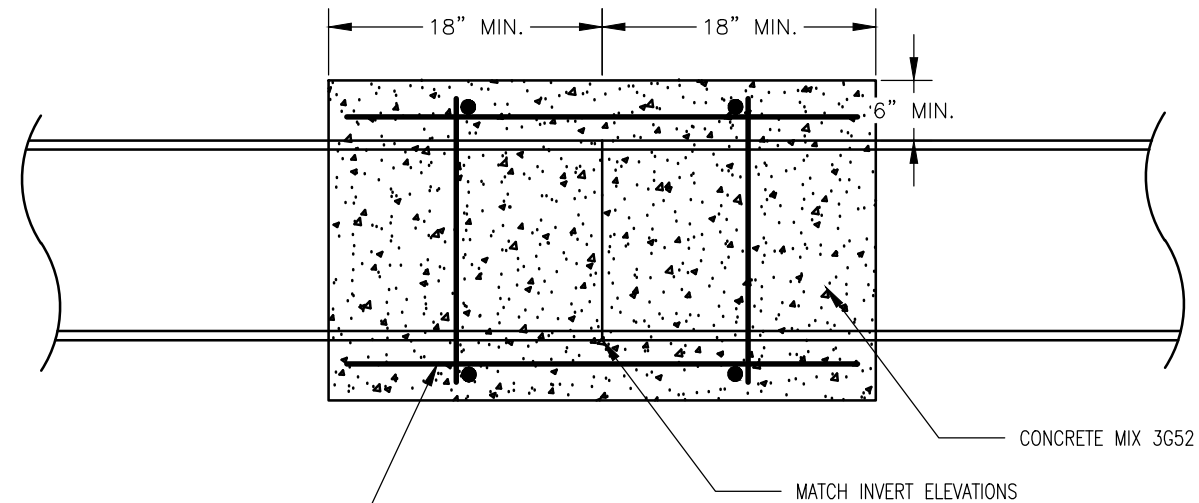
CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

STATE AID PROJECT NO.: NA

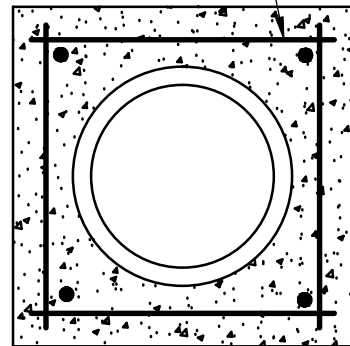


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PROFILE VIEW

#4 EPOXY COATED REBAR



SECTION VIEW

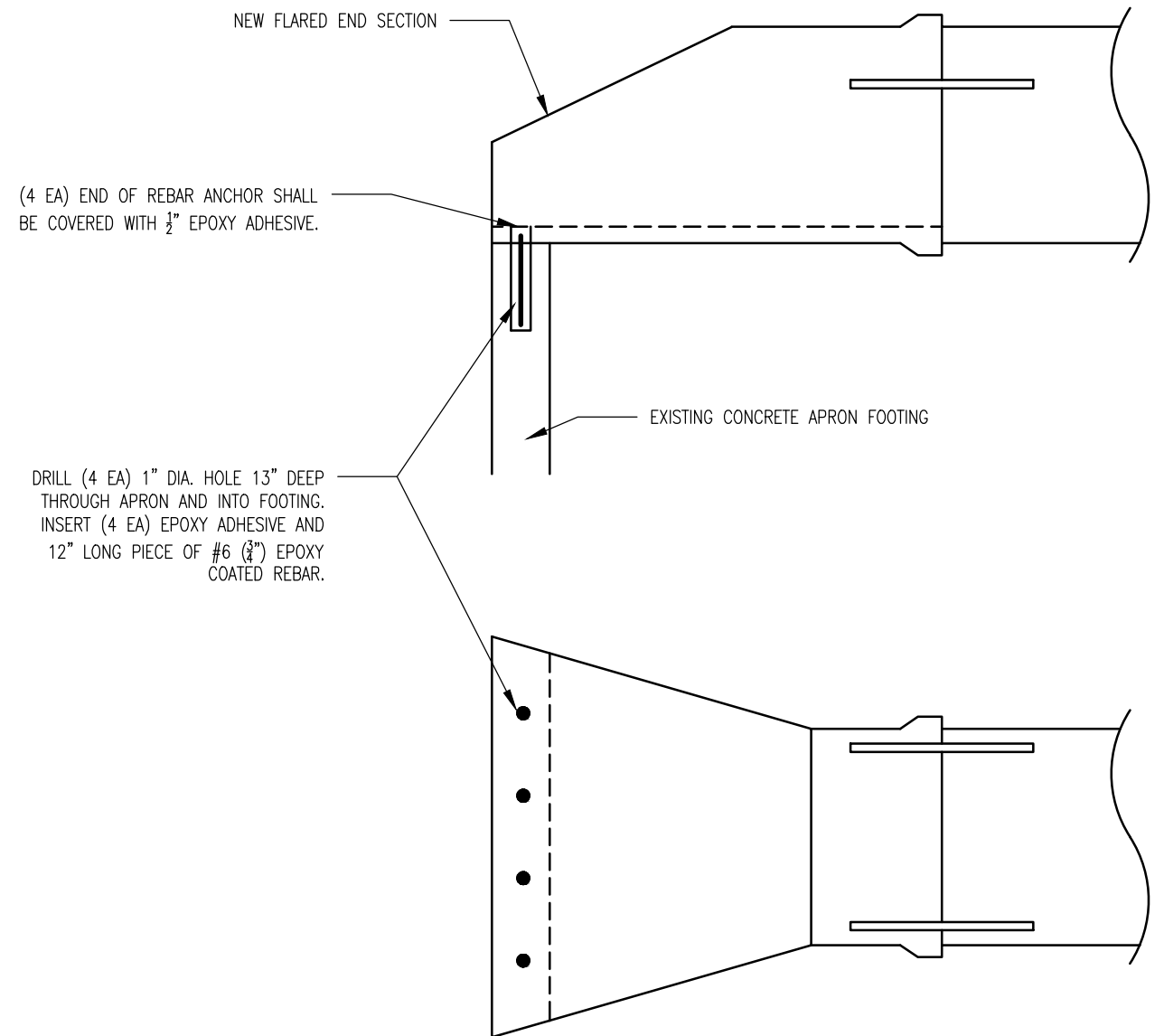
NOTES:

1. PROVIDE #4 EPOXY COATED REINFORCEMENT WITH MINIMUM 3 INCHES OF EMBEDMENT.
2. 36" RC PIPE CULVERT AT SITE 3.
3. 42" RC PIPE CULVERT AT SITE 28.

CULVERT PIPE CONSTRUCTION JOINT

CITY OF DULUTH DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE



(4 EA) END OF REBAR ANCHOR SHALL  
BE COVERED WITH  $\frac{1}{2}$ " EPOXY ADHESIVE.

DRILL (4 EA) 1" DIA. HOLE 13" DEEP  
THROUGH APRON AND INTO FOOTING.  
INSERT (4 EA) EPOXY ADHESIVE AND  
12" LONG PIECE OF #6 ( $\frac{3}{4}$ ") EPOXY  
COATED REBAR.

EXISTING CONCRETE APRON FOOTING

\* 42" RC PIPE CULVERT AT SITE 28

DRILL & EPOXY REINFORCEMENT BAR FOOTING/APRON DETAIL

CITY OF DULUTH DETAIL  
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE

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SIGNATURE:

THOMAS M. PFEFFER  
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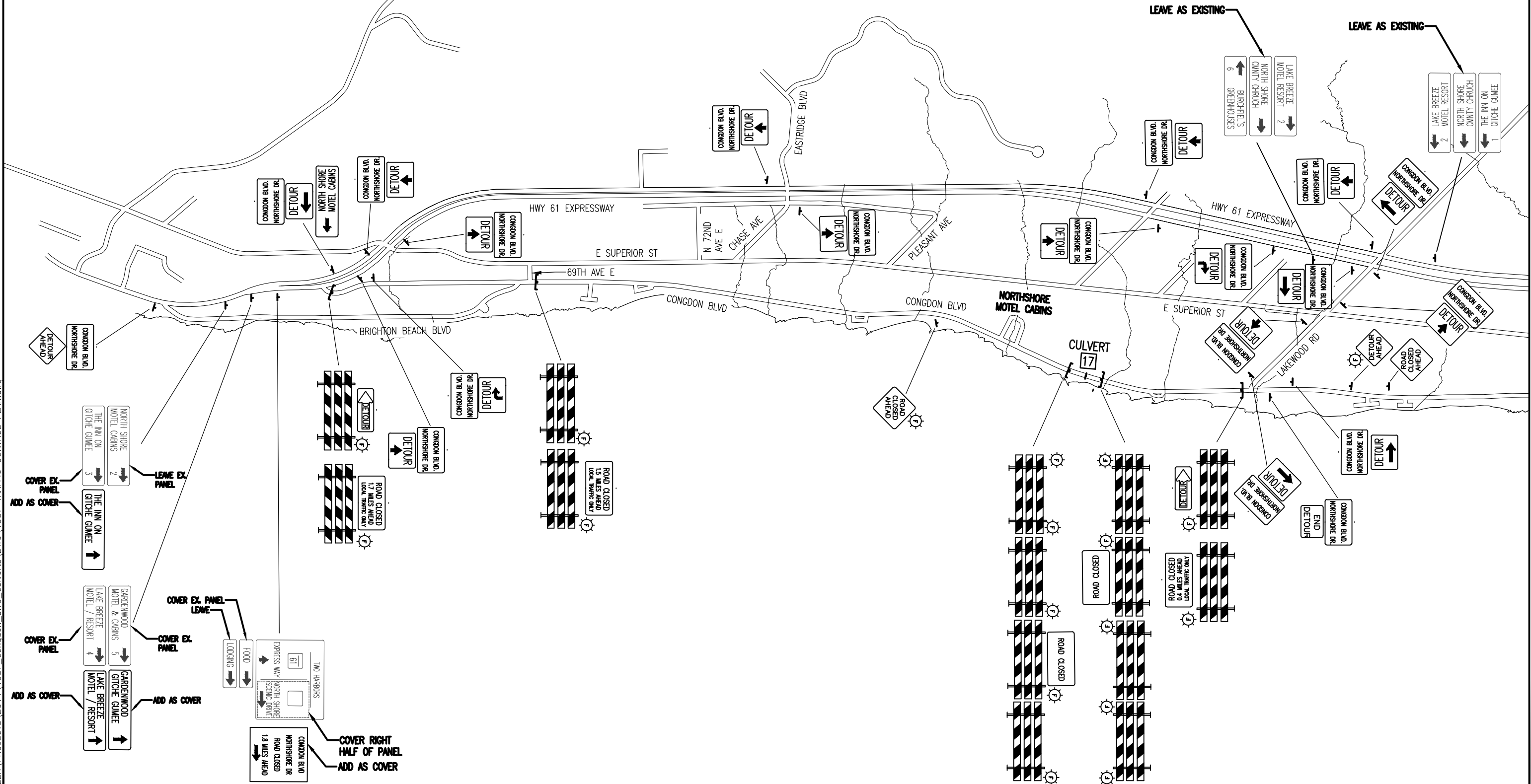
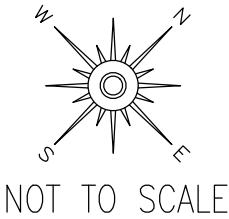
STATE AID PROJECT NO.: NA

DRAWN BY: JJM

DETAILS 2

SHEET NO. 5 OF 40

DETOUR 1 LAYOUT -  
TO BE USED FOR CULVERT  
REPLACEMENT AT SITE 17



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TRAFFIC CONTROL - DETOUR 1

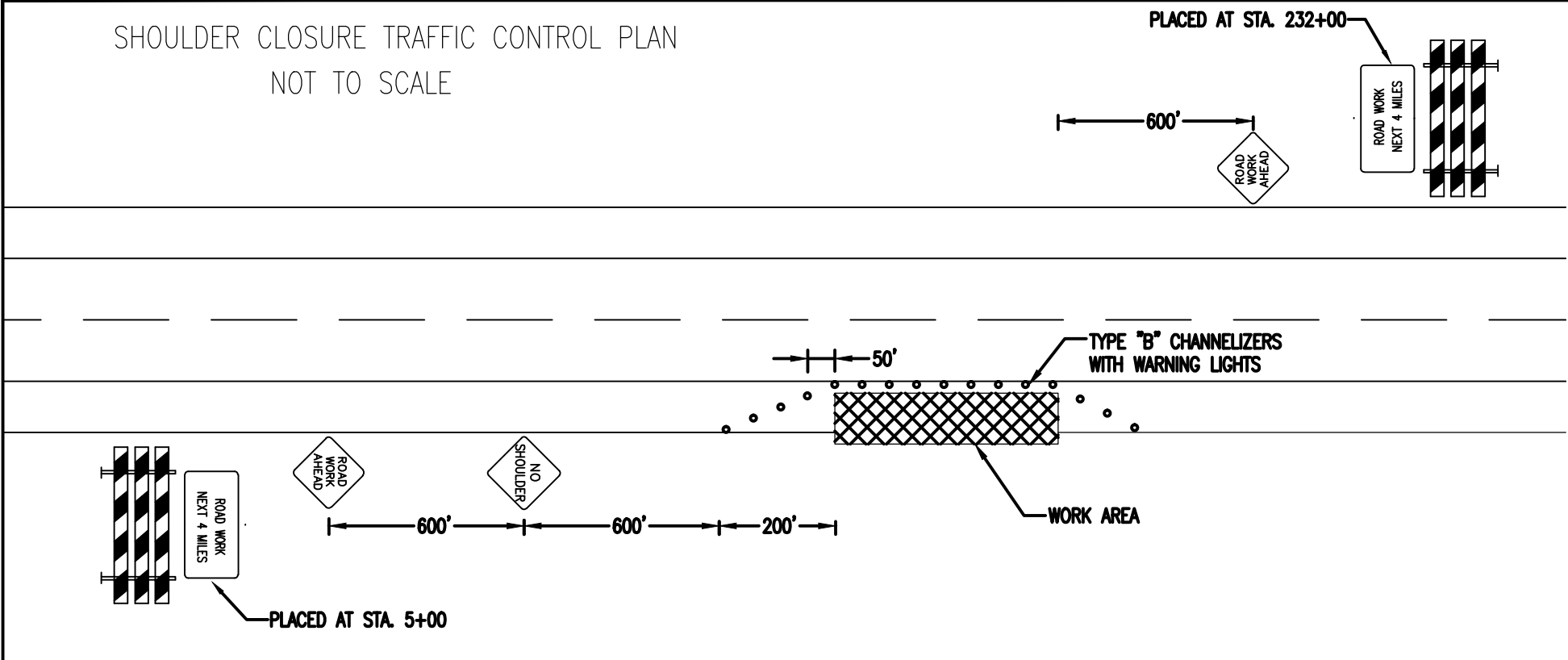
SHEET NO. 6 OF 40



SHEET NO. 7 OF 40



SHOULDER CLOSURE TRAFFIC CONTROL PLAN  
NOT TO SCALE



- 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 SIGNING 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.
  7. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ANY WORK AREAS NEAR TRAFFIC IN ACCORDANCE WITH MMUTCD.
  8. IF THE CONTRACTOR DECIDES TO PERFORM THE CONSTRUCTION WORK IN A SEQUENCE OTHER THAN SHOWN IN THIS TRAFFIC CONTROL PLAN, THE CONTRACTOR SHALL PROVIDE COMPLETE REVISED TRAFFIC CONTROL PLANS TO BE APPROVED BY THE ENGINEER.
  9. ALL TRAFFIC CONTROL DEVICES ON ROADS OPEN TO TRAFFIC THAT ARE NOT CONSISTENT WITH TRAFFIC OPERATION, SHALL BE COVERED, REMOVED OR REVISED AS DIRECTED BY THE ENGINEER.
  10. ALL DEVICES SHALL BE MOVED OR COVERED AS SOON AS THEY ARE NO LONGER REQUIRED OR APPROPRIATE.
  11. CONTRACTOR TO VERIFY ALL EXISTING SIGN SIZES AND PREPARE CUSTOM SIGNS APPROPRIATELY.

TRAFFIC – BILL OF MATERIALS					
SIGN NO.	MESSAGE	SIZE	NO. REQ'D DETOUR 1	NO. REQ'D DETOUR 2	NO. REQ'D PER SHOULDER CLOSURE
W20-1		48" X 48" BLACK ON ORANGE			2
W20-3		48" X 48" BLACK ON ORANGE	2	2	
TYPE III BARRICADE		8 FT ORANGE ON WHITE	14	10	2 TOTAL
M4-10L		48" X 18" BLACK ON ORANGE	1	1	
M4-10R		48" X 18" BLACK ON ORANGE	1	1	
M4-9ML		42" X 36" BLACK ON ORANGE	3	6	
M4-9MR		42" X 36" BLACK ON ORANGE	2	6	
M4-9MT		42" X 36" BLACK ON ORANGE	10	8	
M4-9MATR90		42" X 36" BLACK ON ORANGE	2	1	
M4-9MATL90		42" X 36" BLACK ON ORANGE	0	1	

TRAFFIC – BILL OF MATERIALS					
SIGN NO.	MESSAGE	SIZE	NO. REQ'D DETOUR 1	NO. REQ'D DETOUR 2	NO. REQ'D PER SHOULDER CLOSURE
R11-2		48" X 30" BLACK ON WHITE	2	2	
R11-3A		60" X 30" BLACK ON WHITE	3	1	
G20-X8		48" X 24" BLACK ON ORANGE	19	24	
W8-23		48" X 48" BLACK ON ORANGE			1
M4-8A		24" X 18" BLACK ON WHITE	1	2	
W20-2		36" X 36" BLACK ON ORANGE	2	2	
G20-X4		72" X 18" BLACK ON ORANGE	1		
G20-X4		72" X 18" BLACK ON ORANGE	1		
G20-X4		72" X 18" BLACK ON ORANGE	1	1	
G20-X4		72" X 18" BLACK ON ORANGE	1		

TRAFFIC – BILL OF MATERIALS					
SIGN NO.	MESSAGE	SIZE	NO. REQ'D DETOUR 1	NO. REQ'D DETOUR 2	NO. REQ'D PER SHOULDER CLOSURE
G20-X4		72" X 18" BLACK ON ORANGE		2	
G20-1		60" X 24" BLACK ON ORANGE			2 TOTAL
G20-X4		72" X 18" BLACK ON ORANGE		1	
G20-X4		72" X 18" BLACK ON ORANGE		1	
G20-X4		72" X 18" BLACK ON ORANGE		1	
G20-X8		42" X VAR. BLACK ON ORANGE		1	
G20-X8		~54" X ~54" BLACK ON ORANGE	1		
		FLASHING AMBER WARNING LIGHTS	18	15	1 PER TYPE B CHANNELIZER

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THOMAS M. PFEFFER  
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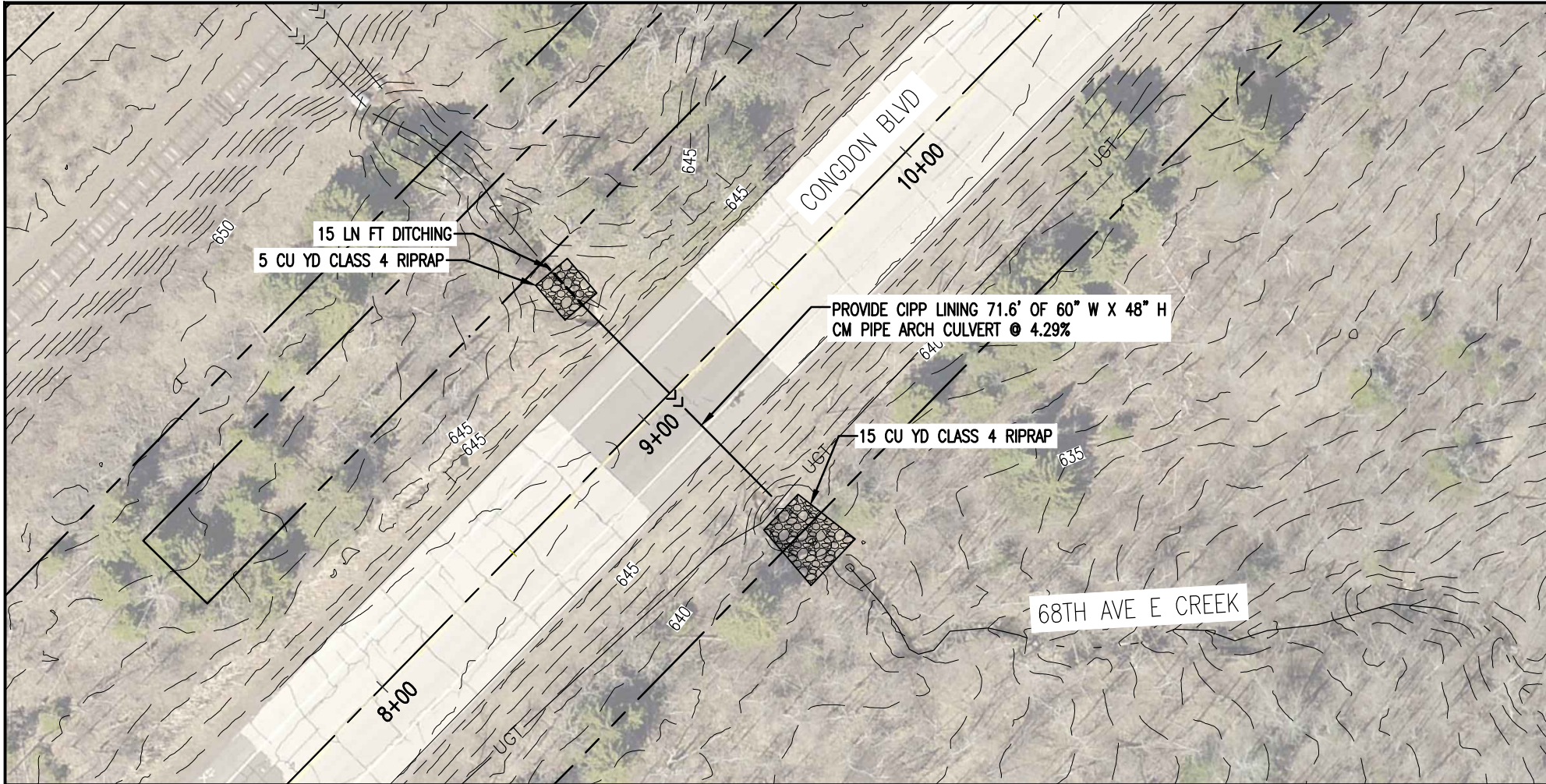
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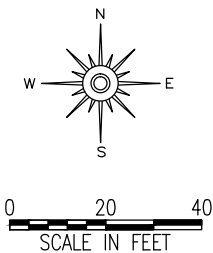
DRAWN BY: JJM

TRAFFIC CONTROL 3

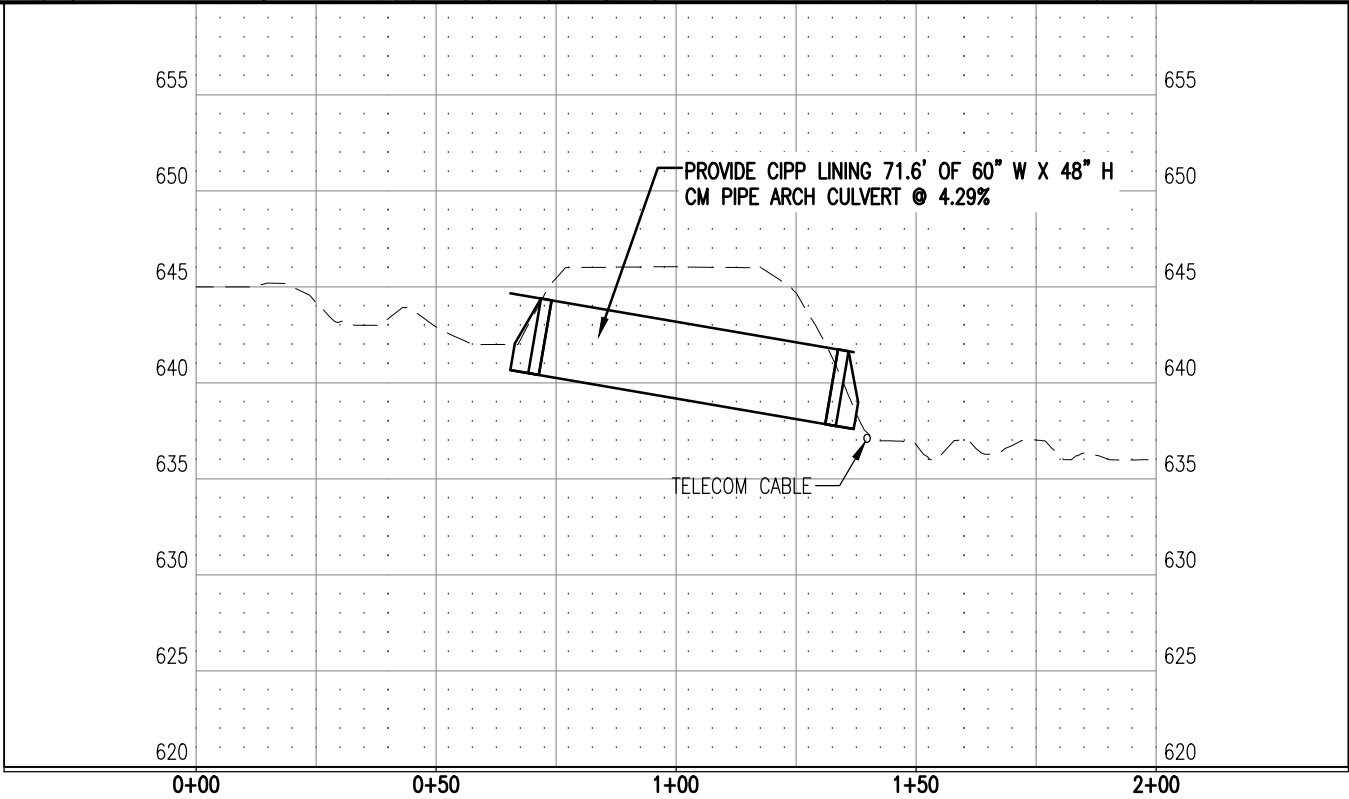
SHEET NO. 8 OF 40



CULVERT 1 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	15
2503.603	60" X 48" CIPP LINER STORM CULVERT	LF	72
2511.501	RANDOM RIPRAP CLASS IV	CY	20



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 1

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: 3/8/2016  
LIC. NO: 22442



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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

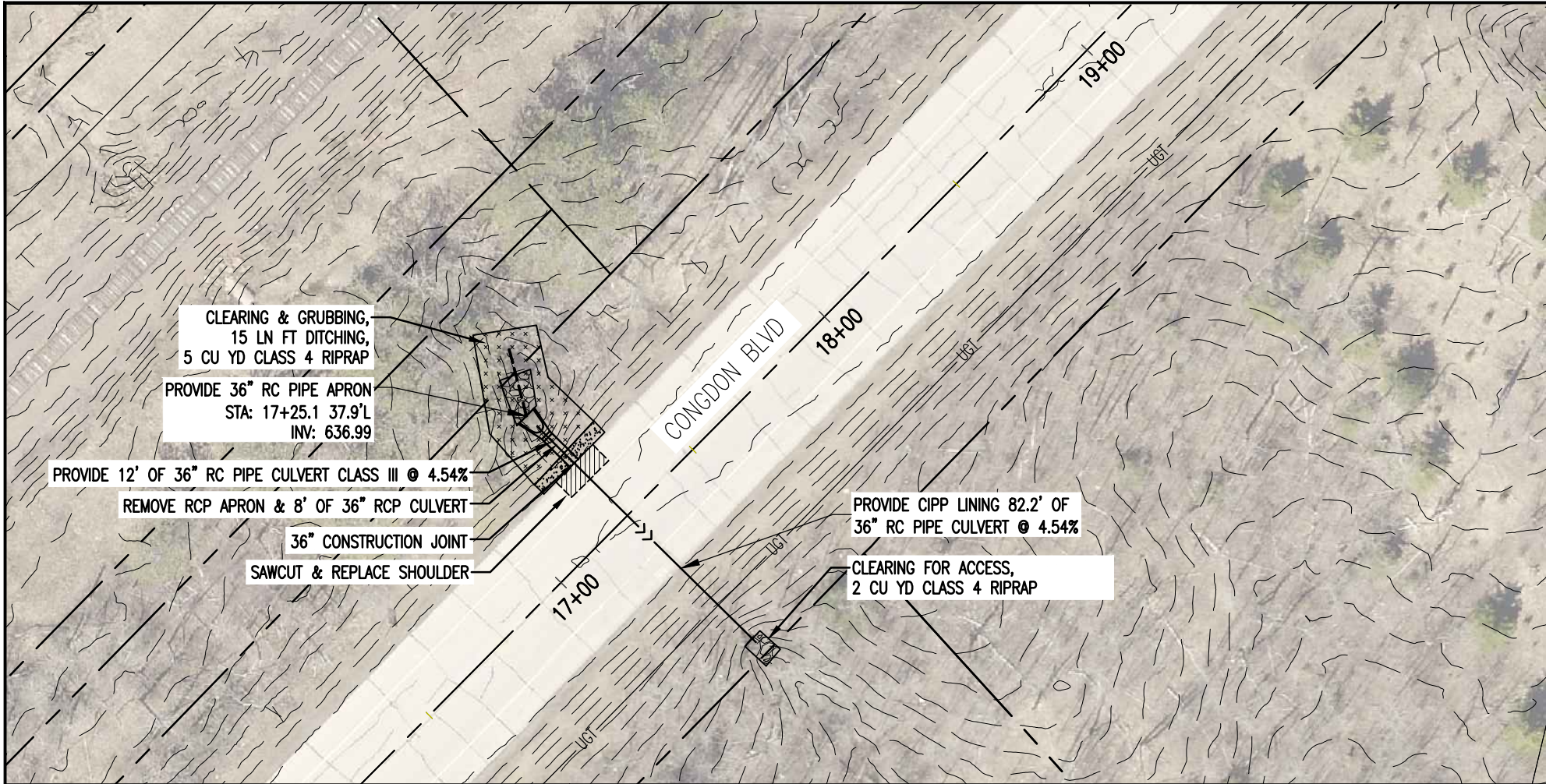
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DRAWN BY: JJM

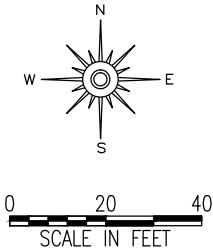
CULVERT 1 PLAN & PROFILE

SHEET NO. 9 OF 40

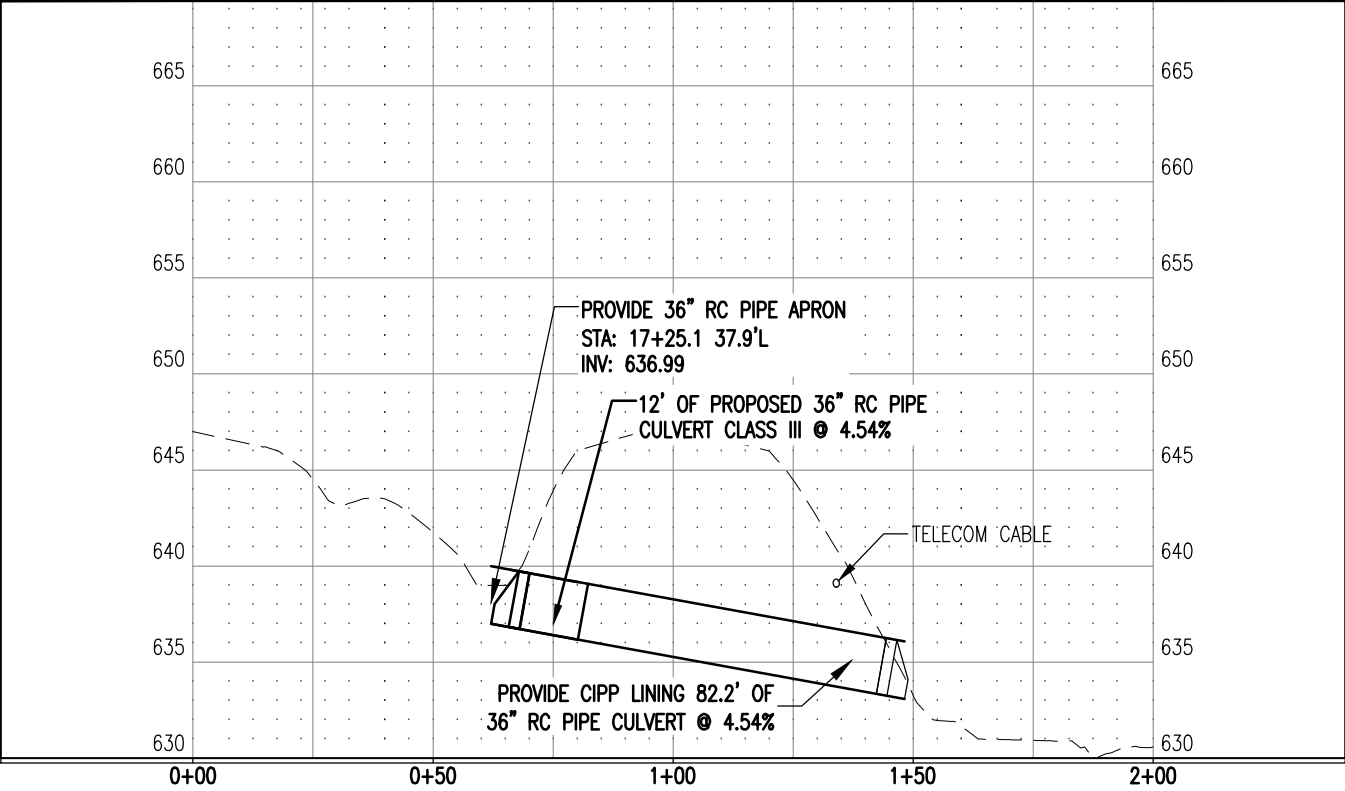




CULVERT 3 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.501	REMOVE CONCRETE CULVERT	LF	8
2104.505	REMOVE BITUMINOUS PAVEMENT	SY	9
2104.509	REMOVE CONCRETE APRON	EACH	1
2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LF	23
2105.603	DITCHING	LF	15
2211.503	AGGREGATE BASE (CV) CLASS 5	CY	10
2360.501	TYPE SP 9.5 WEARING COURSE MIX (3,B)	TON	2
2501.511	36" RCP PIPE CULVERT CLASS III	LF	12
2501.515	36" RCP PIPE APRON	EACH	1
2503.602	CONSTRUCTION JOINT, 36" RC PIPE	EACH	1
2503.603	36" CIPP LINER STORM CULVERT	LF	82
2511.501	RANDOM RIPRAP CLASS IV	CY	5
2574.508	FERTILIZER TYPE 3	POUND	4
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.02
2575.502	SEED MIXTURE 25-141	POUND	2
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	84



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - [Pattern] RANDOM RIPRAP, CLASS III
  - [Pattern] TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - [Pattern] CLASS 5 SHOULDERING
  - [Pattern] REPLACE EXISTING ROAD SECTION



CULVERT 3

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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

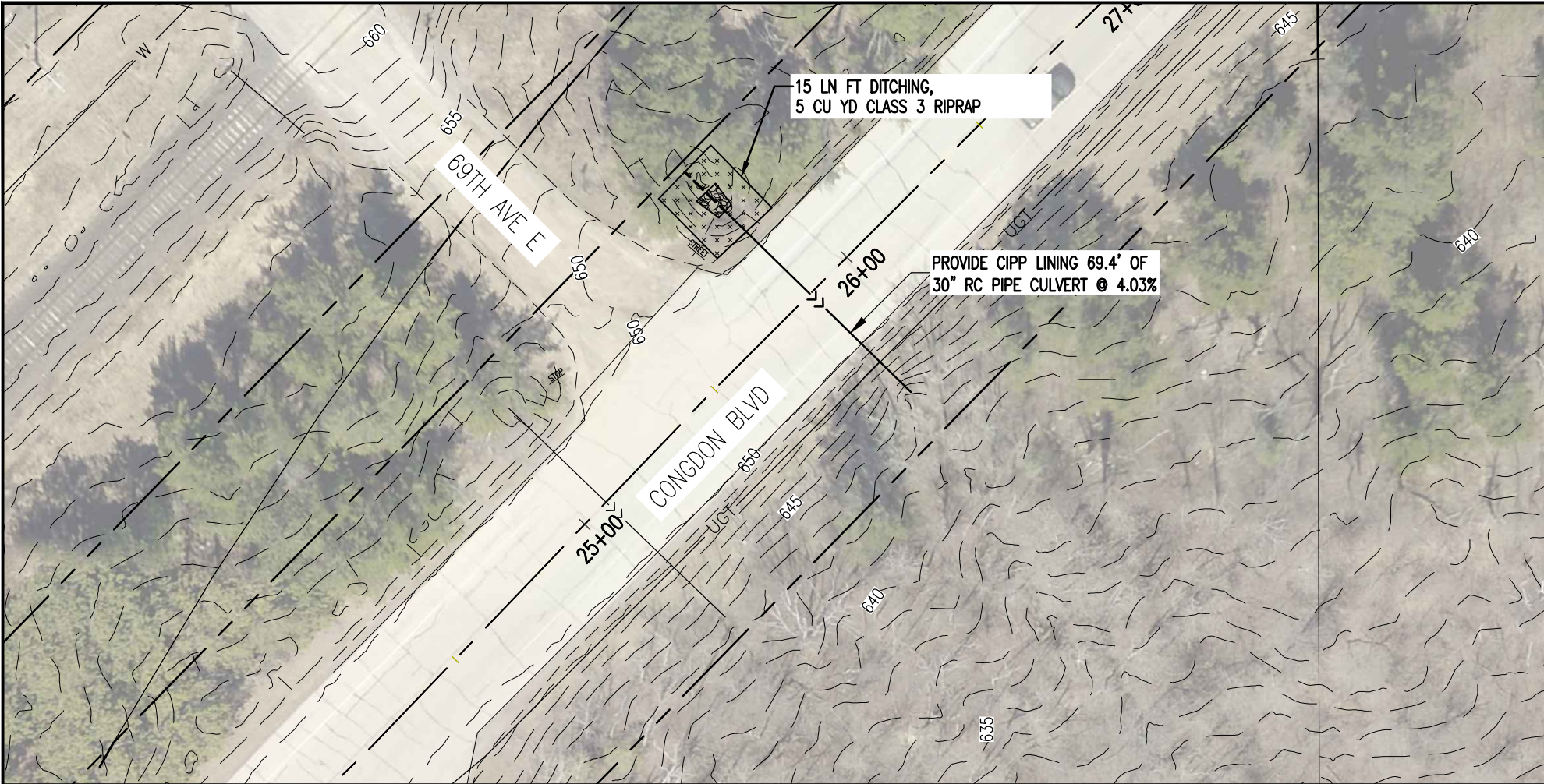
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DRAWN BY: JJM

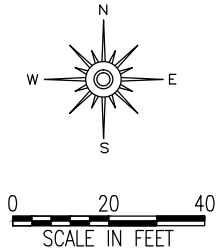
CULVERT 3 PLAN & PROFILE

SHEET NO. 10 OF 40

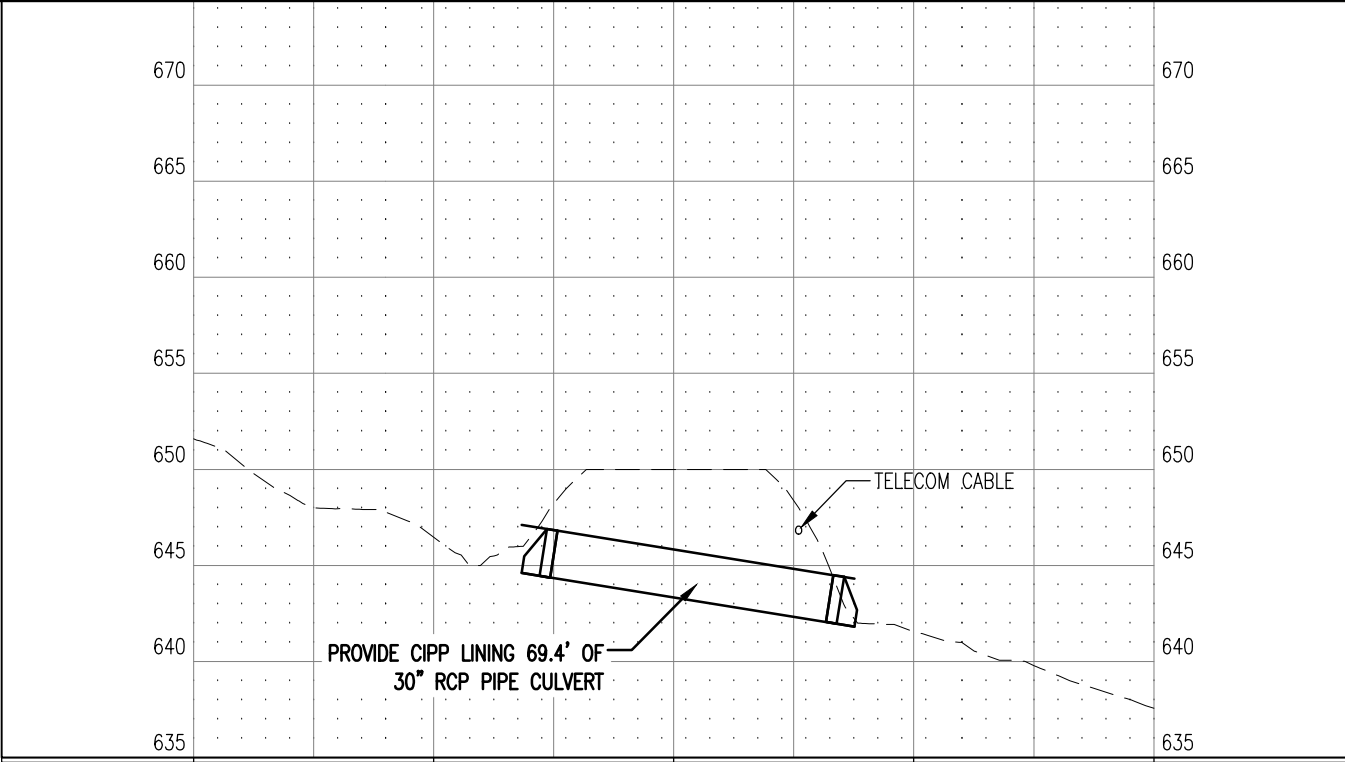




CULVERT 4 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	15
2503.603	30" CIPP LINER STORM CULVERT	LF	69
2511.501	RANDOM RIPRAP CLASS III	CY	5
2574.508	FERTILIZER TYPE 3	POUND	3
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	51



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 4

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

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ENGINEERING DIVISION  
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DULUTH, MN 55802

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

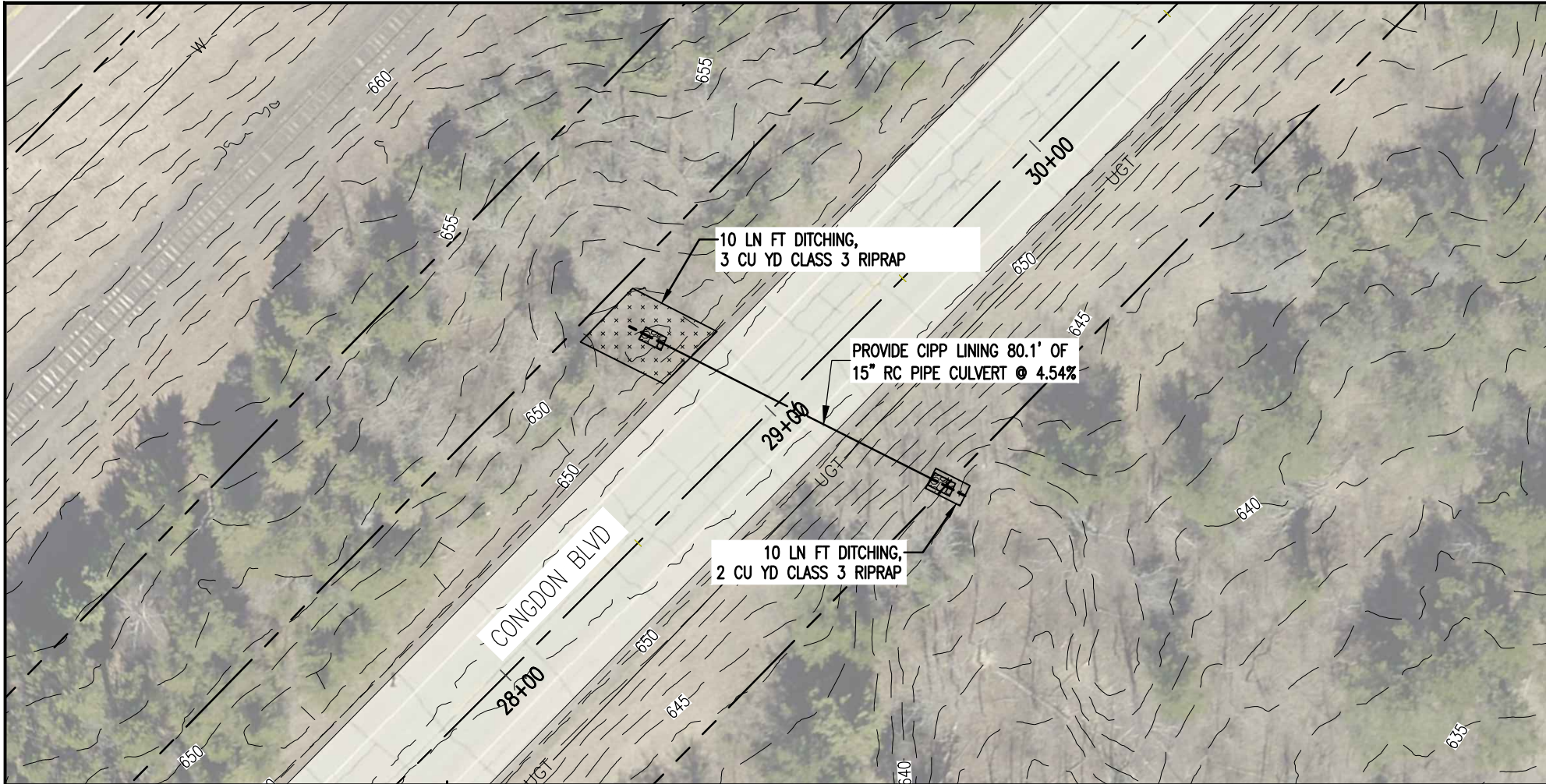
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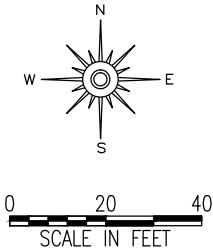
CULVERT 4 PLAN & PROFILE

SHEET NO. 11 OF 40

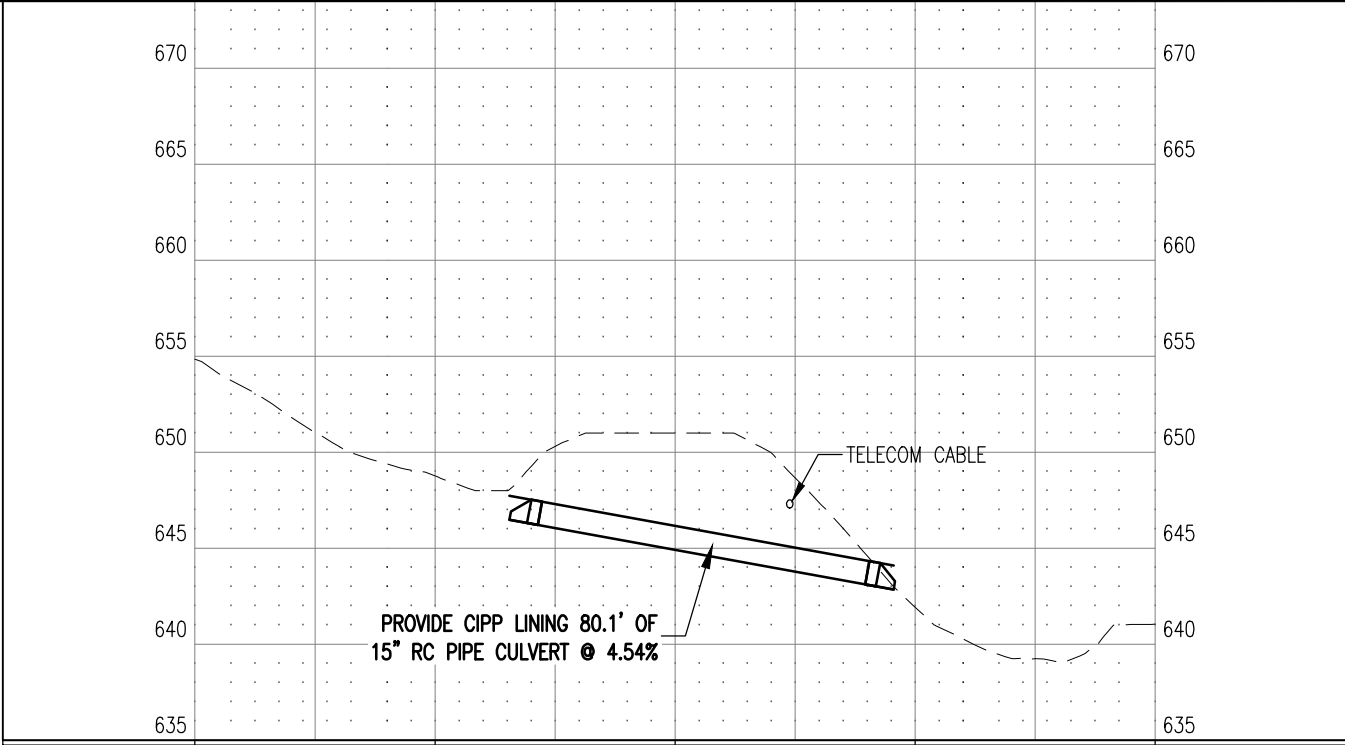




CULVERT 5 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	20
2503.603	15" CIPP LINER STORM CULVERT	LF	80
2511.501	RANDOM RIPRAP CLASS III	CY	5
2574.508	FERTILIZER TYPE 3	POUND	3
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	60



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 5

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CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

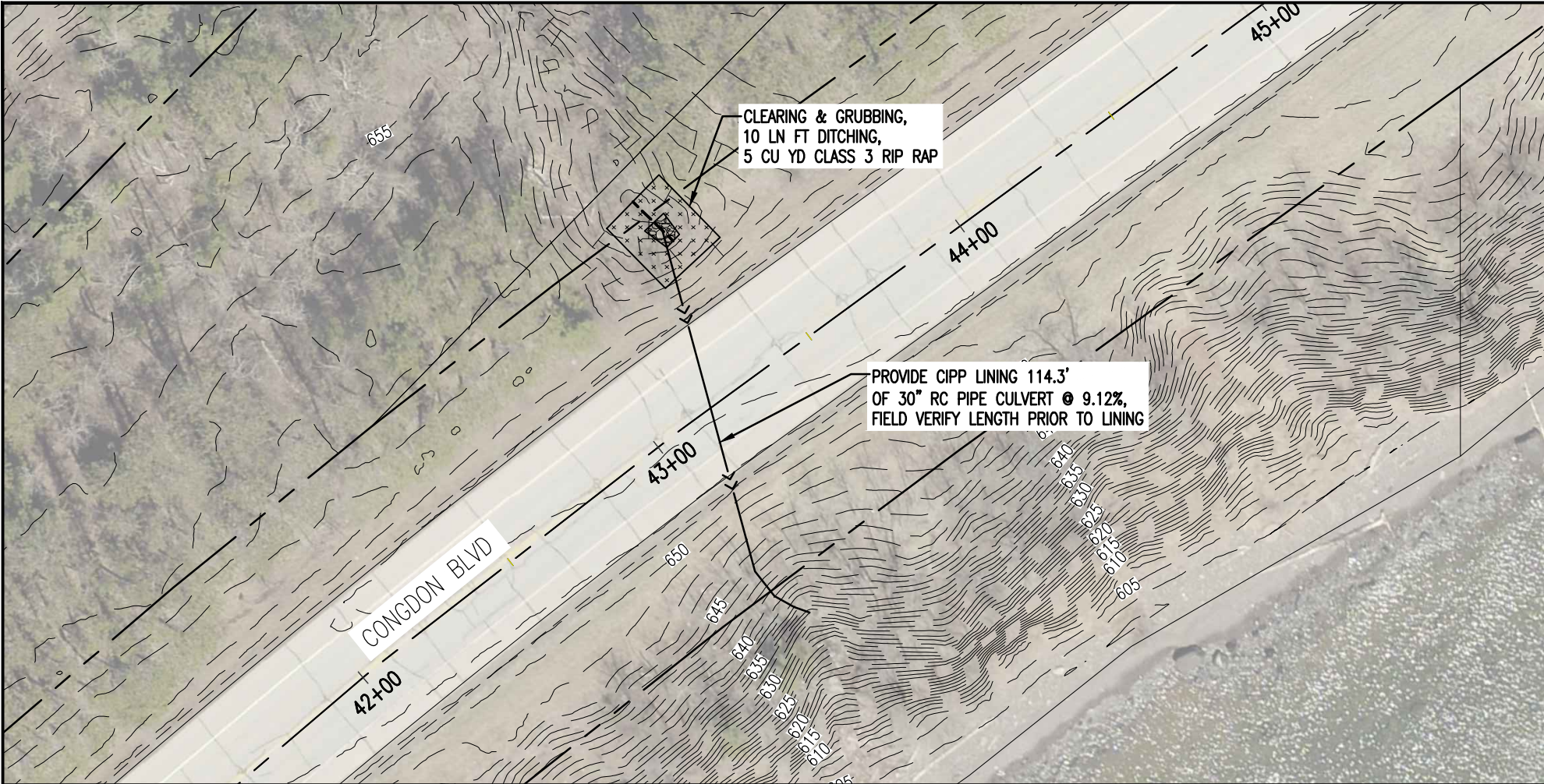
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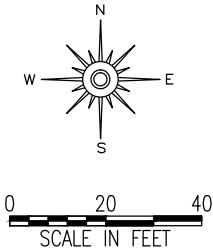
CULVERT 5 PLAN & PROFILE

SHEET NO. 12 OF 40

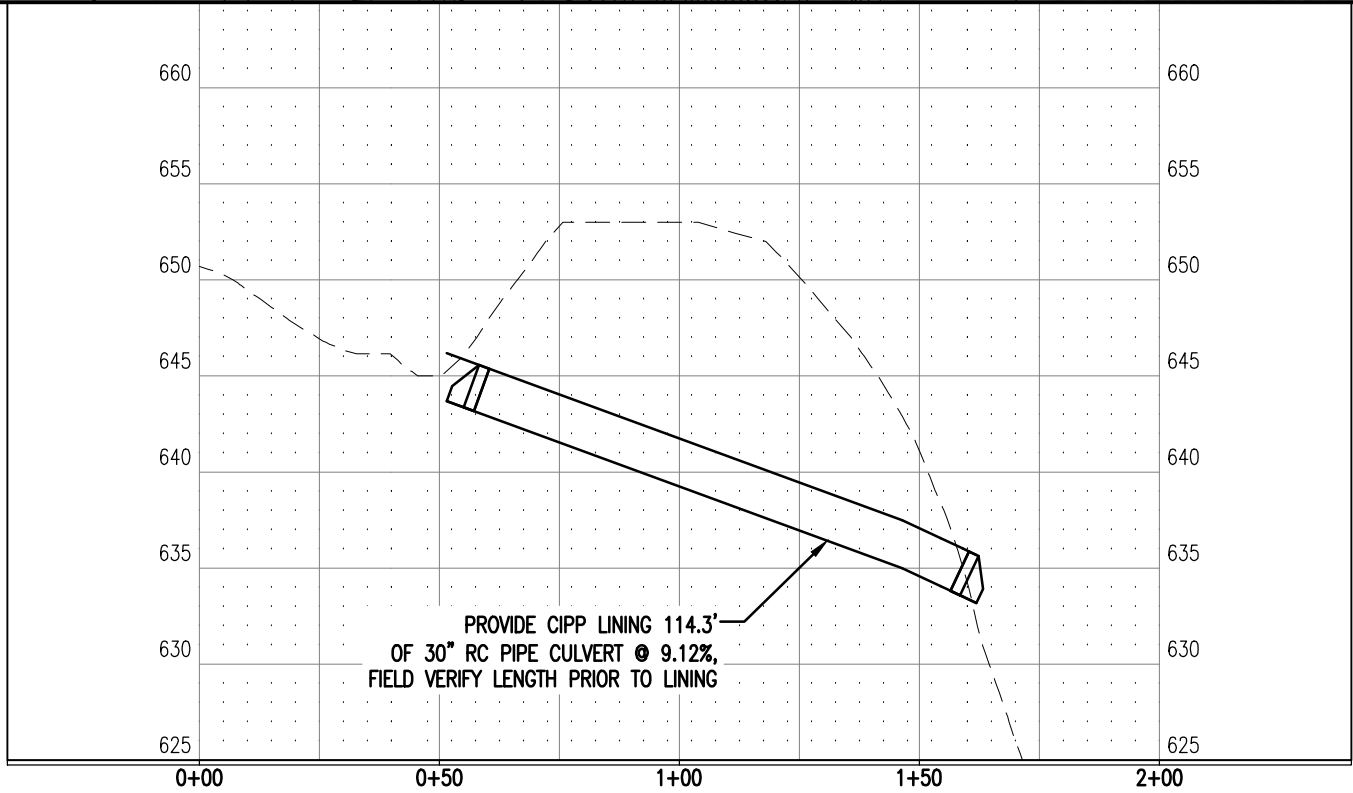




CULVERT 8 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	10
2503.603	30" CIPP LINER STORM CULVERT	LF	114
2511.501	RANDOM RIPRAP CLASS III	CY	5
2574.508	FERTILIZER TYPE 3	POUND	3
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	51



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 8

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THOMAS M. PFEFFER  
TYPE NAME

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LIC. NO.: 22442



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DULUTH, MN 55802

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

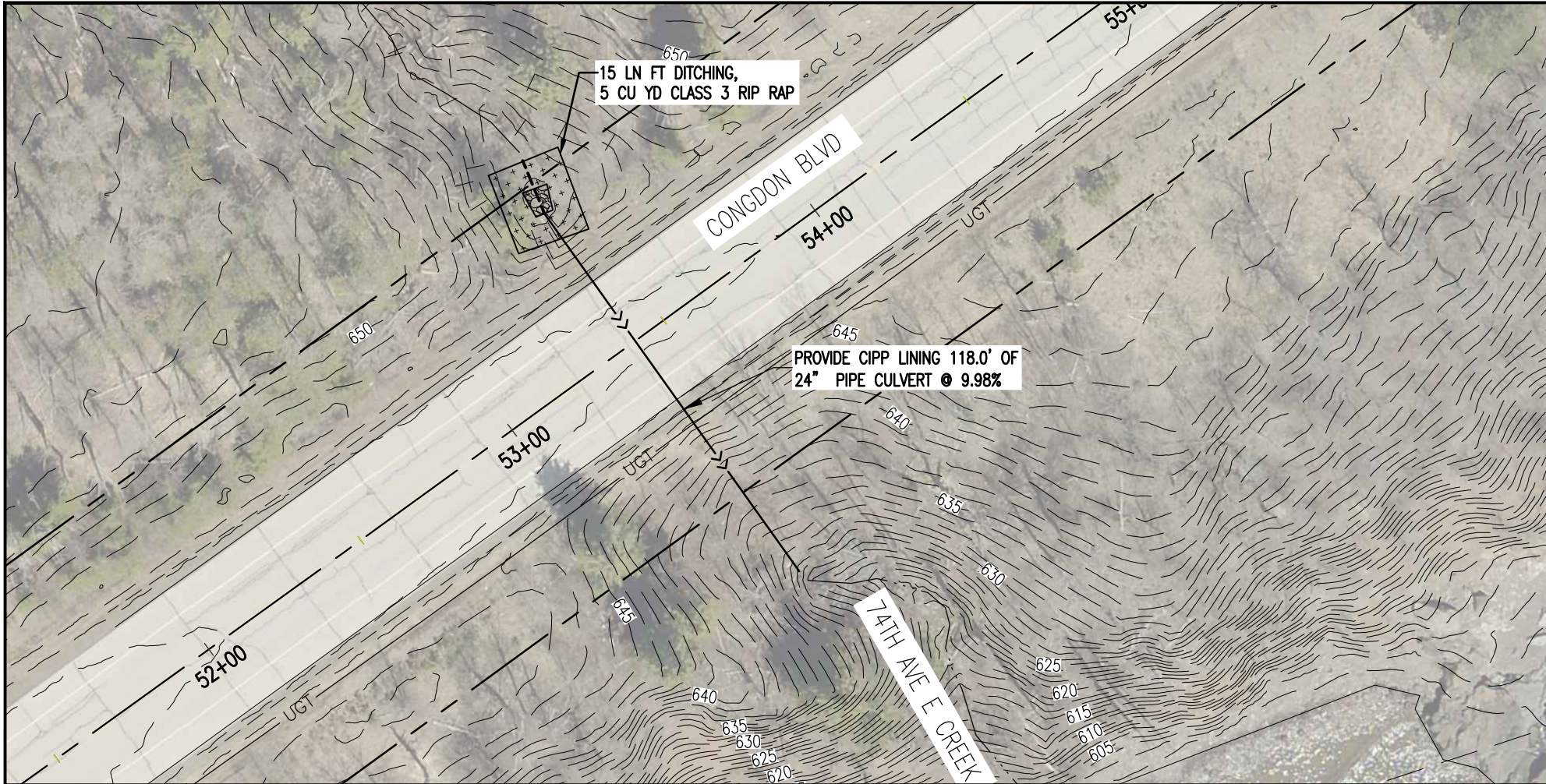
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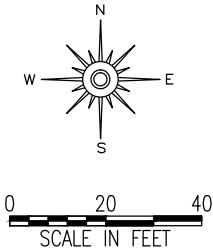
CULVERT 8 PLAN & PROFILE

SHEET NO. 13 OF 40

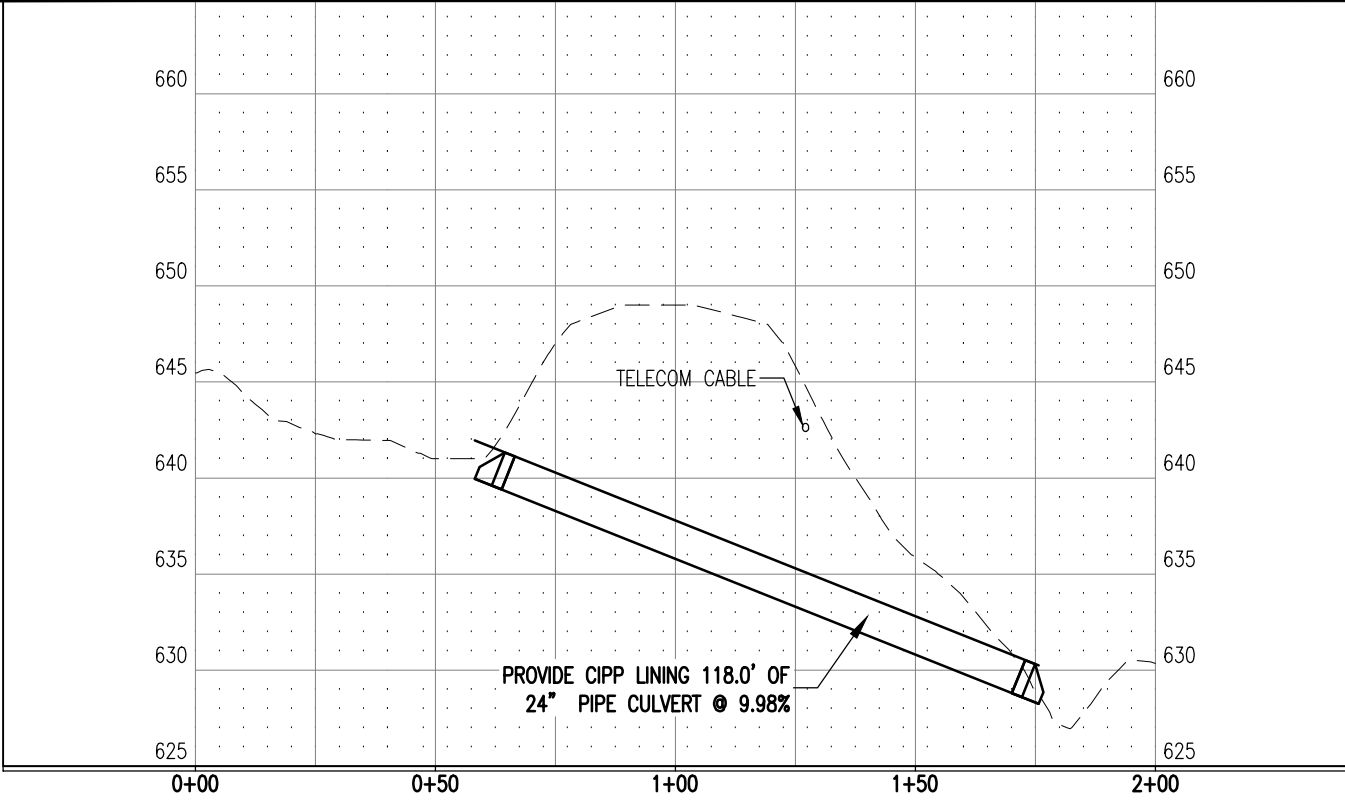




CULVERT 10 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	15
2503.603	24" CIPP LINER STORM CULVERT	LF	118
2511.501	RANDOM RIPRAP CLASS III	CY	5
2574.508	FERTILIZER TYPE 3	POUND	3
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	50



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 10

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CITY PROJECT NO.: 1387

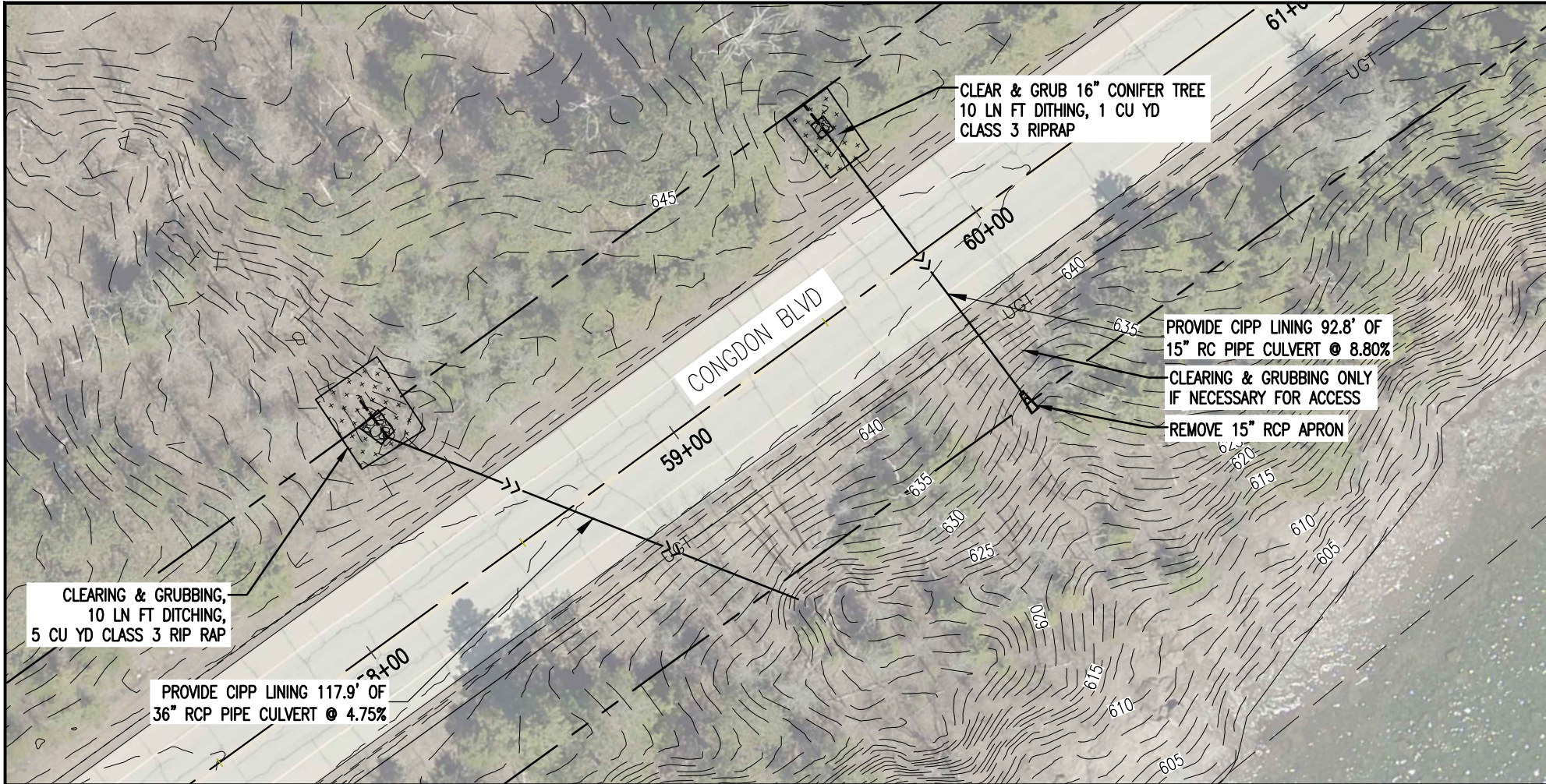
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DRAWN BY: JJM

CULVERT 10 PLAN & PROFILE

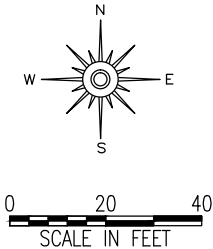
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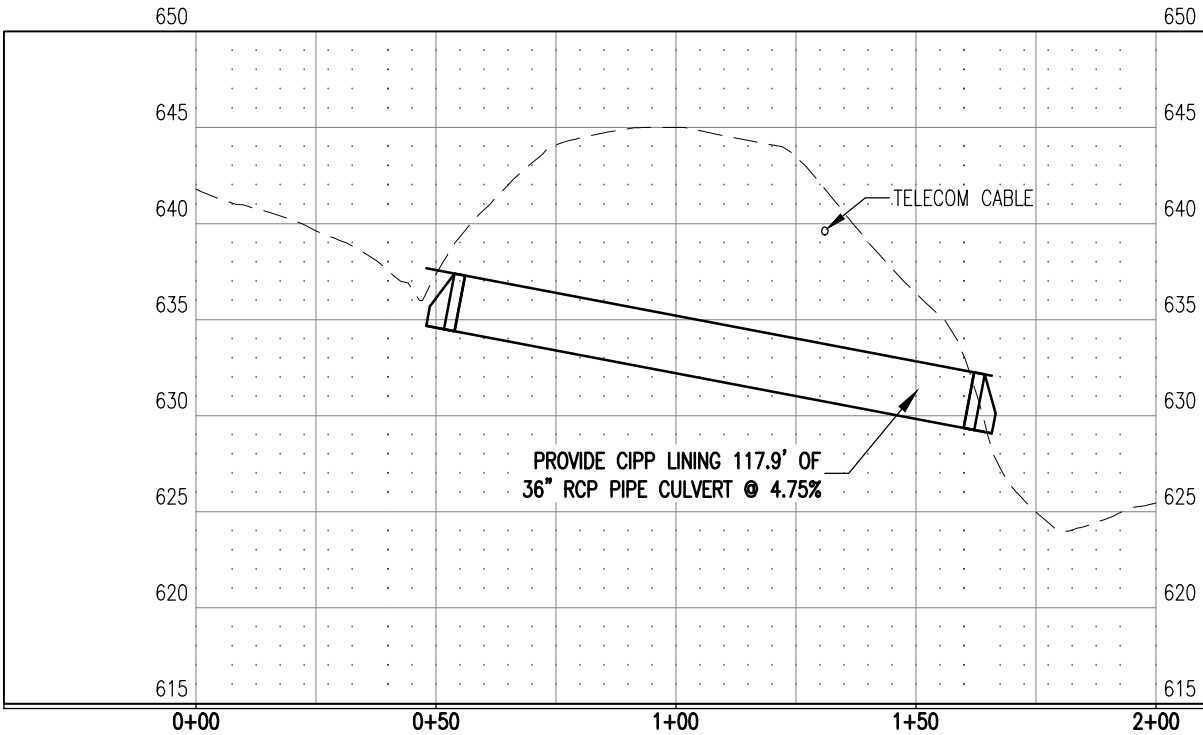


CULVERT 11 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	10
2503.603	36" CIPP LINER STORM CULVERT	LF	118
2511.501	RANDOM RIPRAP CLASS III	CY	5
2574.508	FERTILIZER TYPE 3	POUND	3
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	50

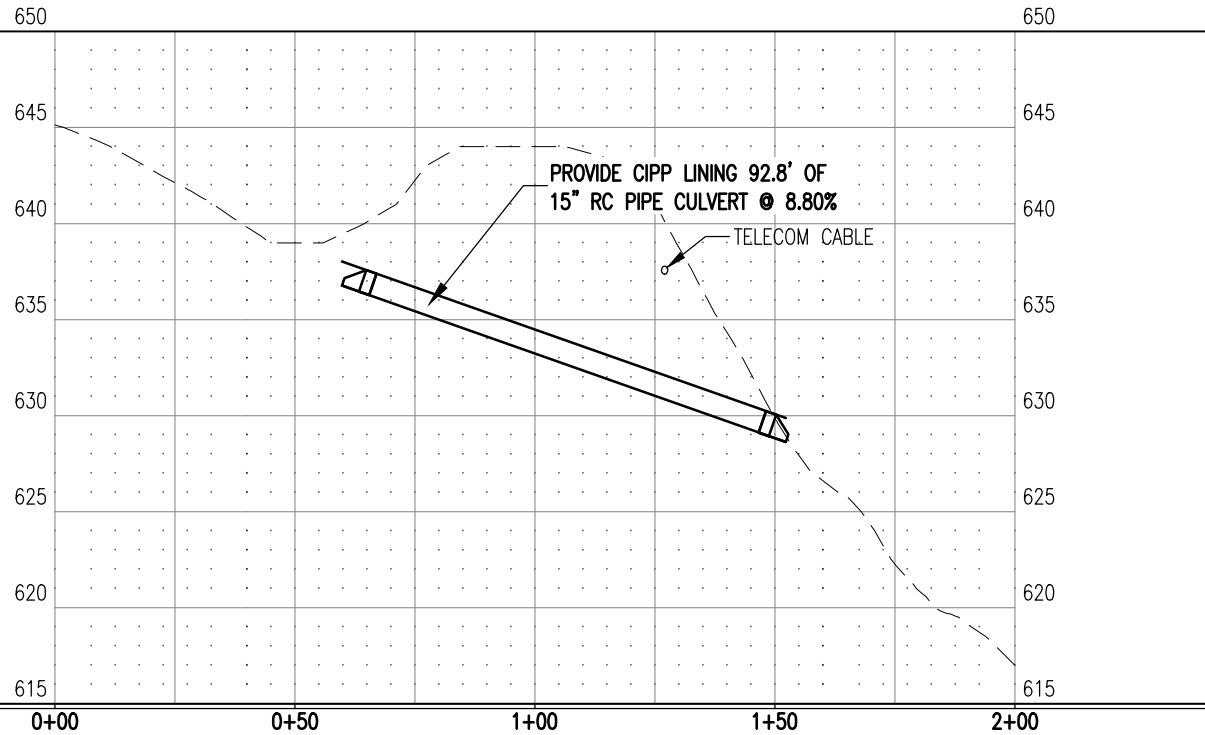
CULVERT 12 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.509	REMOVE CONCRETE APRON	EACH	1
2105.603	DITCHING	LF	10
2503.603	15" CIPP LINER STORM CULVERT	LF	93
2511.501	RANDOM RIPRAP CLASS III	CY	3
2574.508	FERTILIZER TYPE 3	POUND	2
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	28



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 11



CULVERT 12

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

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CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

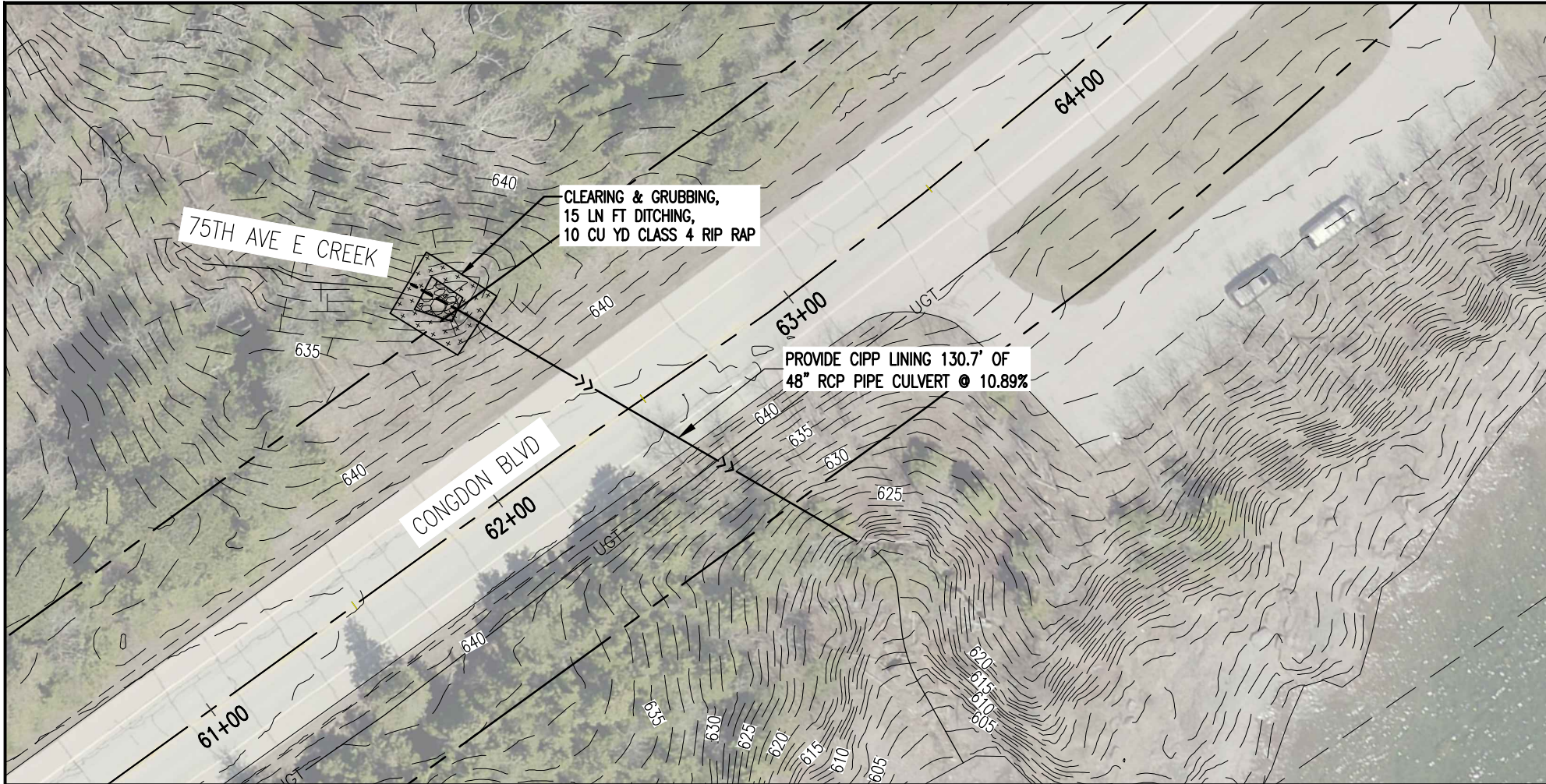
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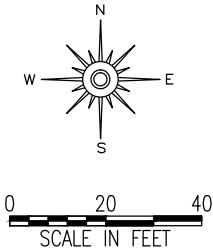
CULVERT 11 & 12 PLAN & PROFILE

SHEET NO. 15 OF 40

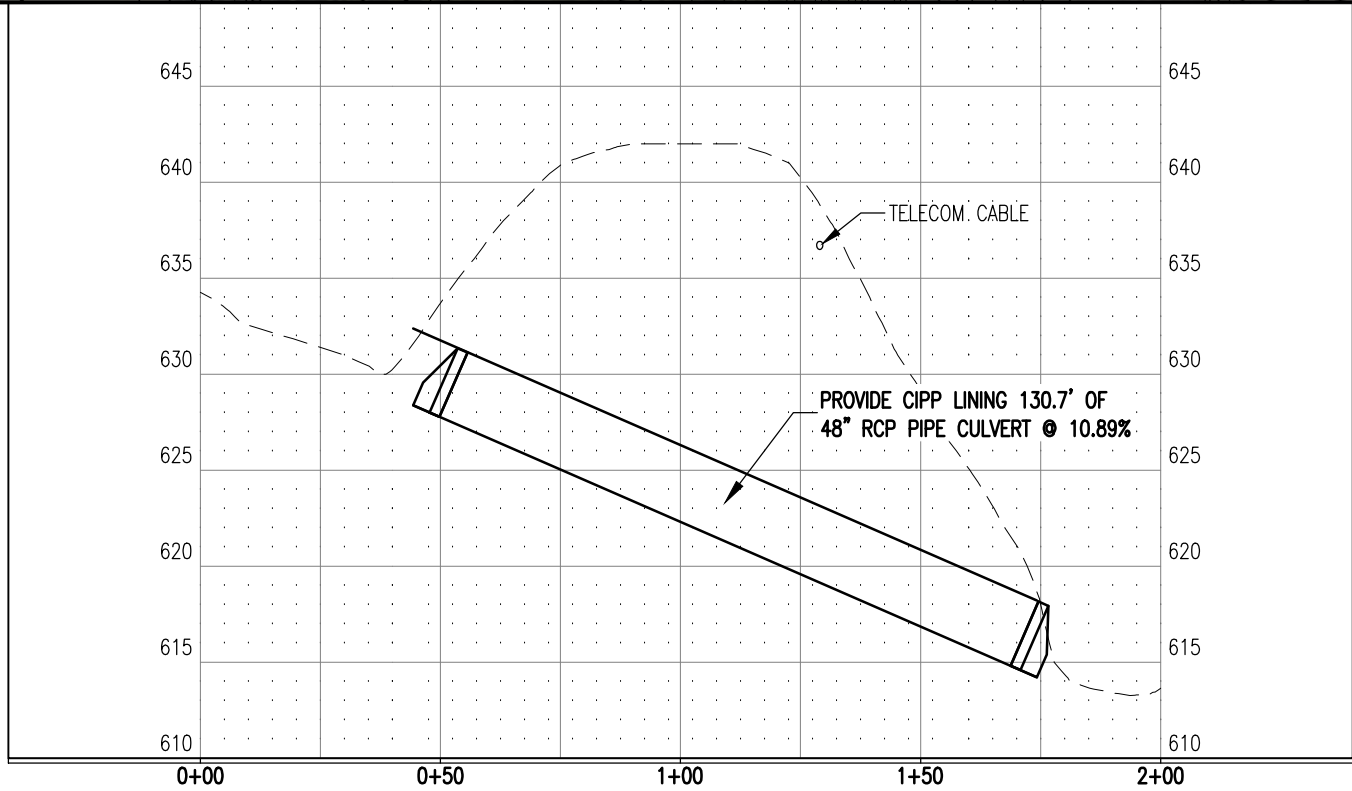




CULVERT 13 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	15
2503.603	48" CIPP LINER STORM CULVERT	LF	131
2511.501	RANDOM RIPRAP CLASS IV	CY	10
2574.508	FERTILZER TYPE 3	POUND	3
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	50



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
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  - REPLACE EXISTING ROAD SECTION



CULVERT 13

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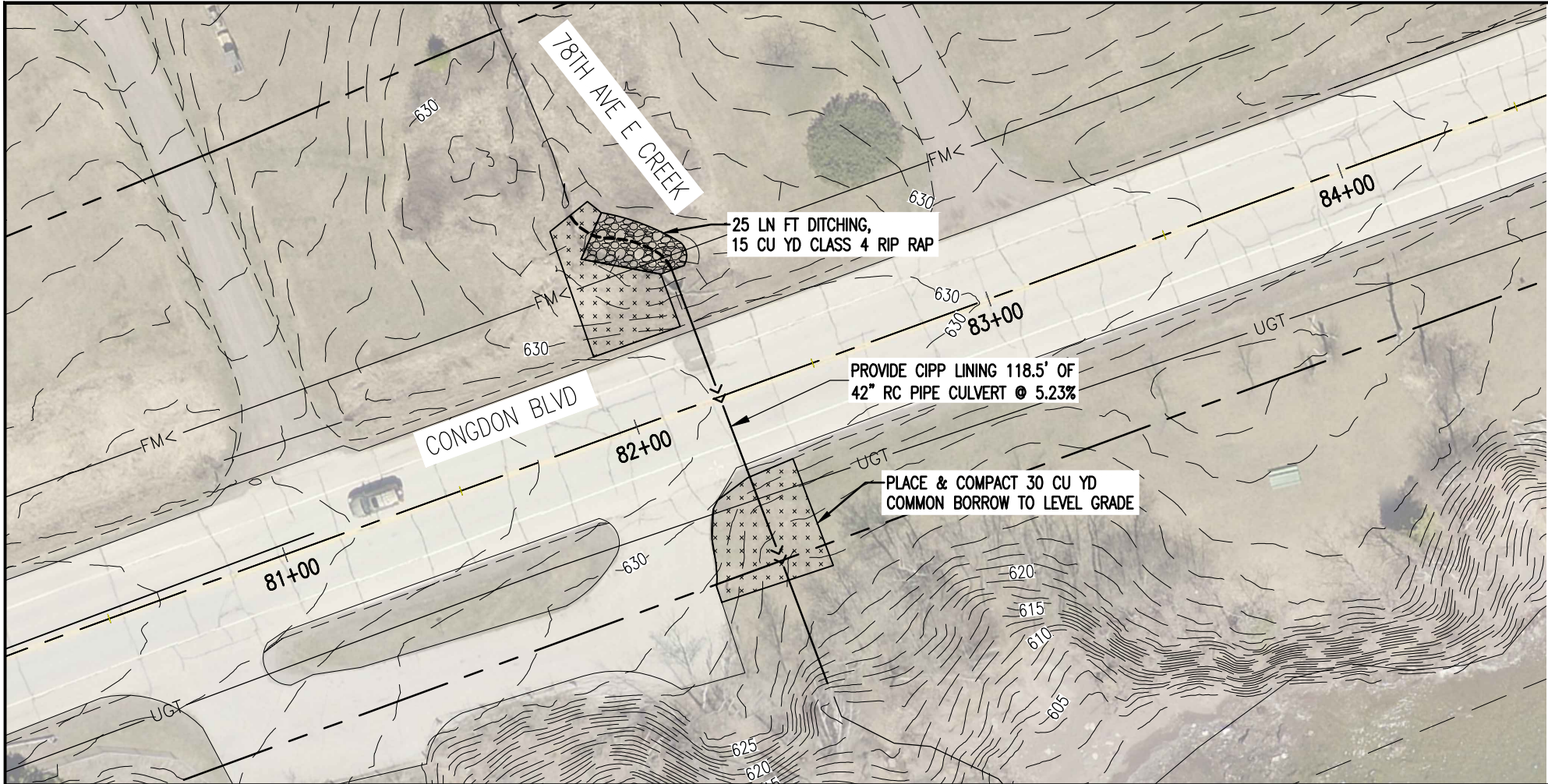
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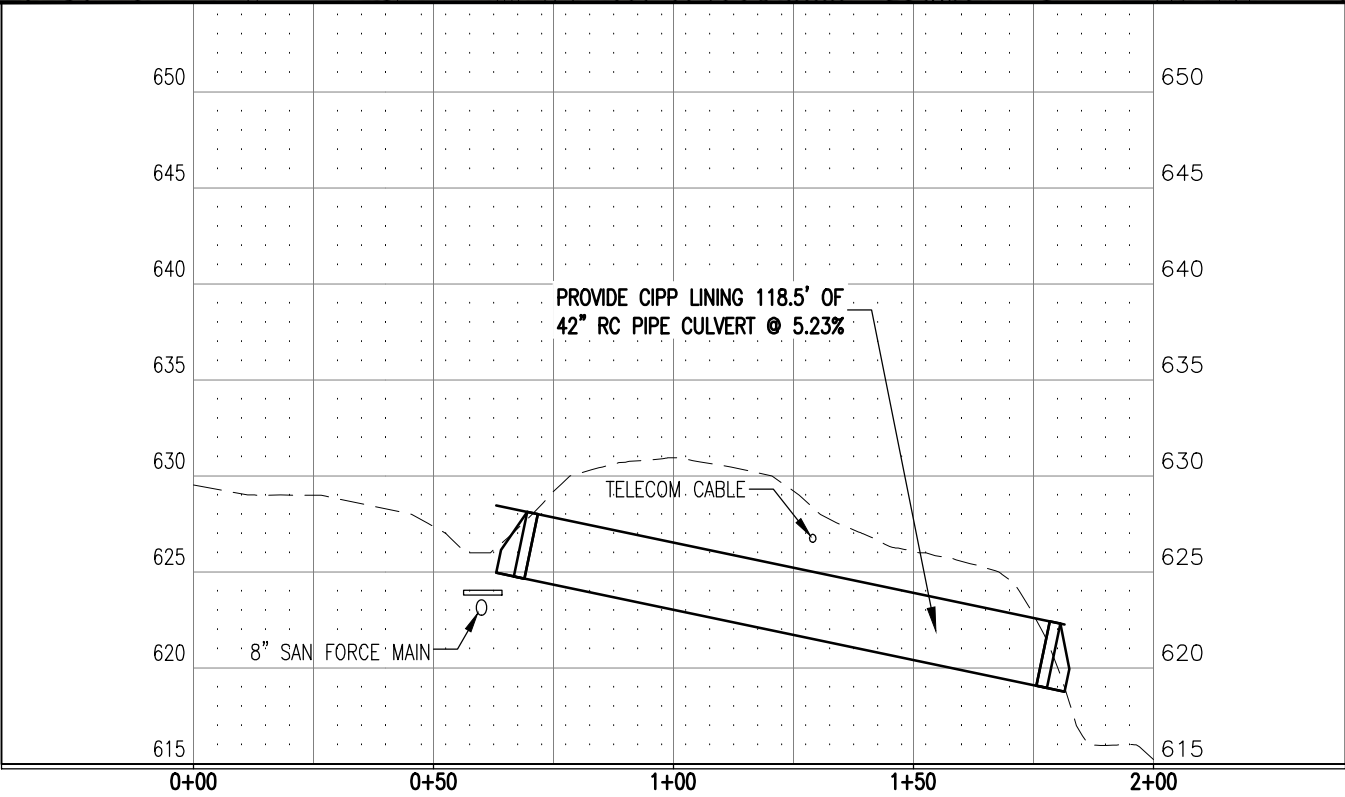
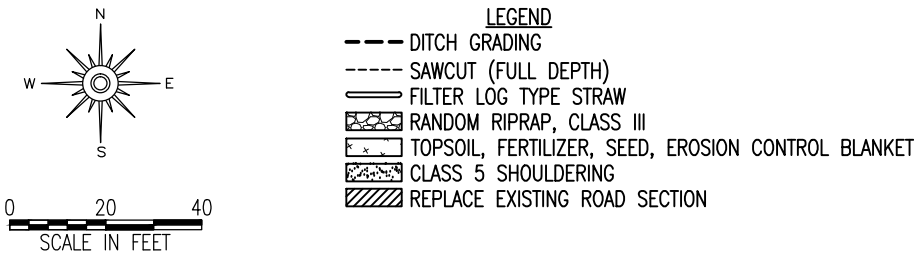
CULVERT 13 PLAN & PROFILE

SHEET NO. 16 OF 40





CULVERT 15 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.523	COMMON BORROW (LV)	C Y	30
2105.603	DITCHING	LF	25
2503.603	42" CIPP LINER STORM CULVERT	LF	119
2511.501	RANDOM RIPRAP CLASS IV	CY	15
2574.508	FERTILIZER TYPE 3	POUND	7
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.03
2575.502	SEED MIXTURE 25-141	POUND	3
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	162



CULVERT 15

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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THOMAS M. PFEFFER  
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CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

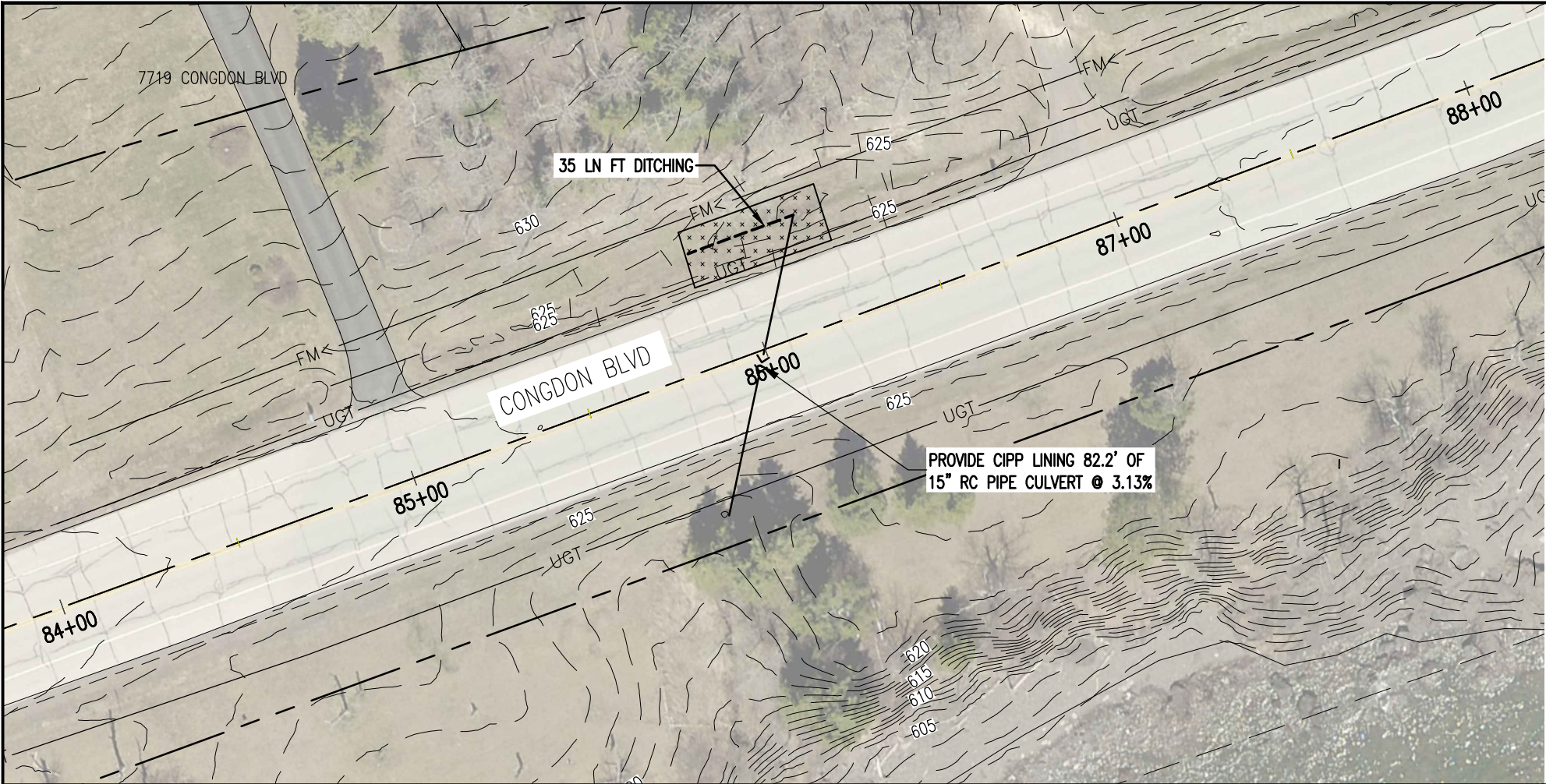
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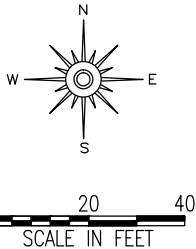
CULVERT 15 PLAN & PROFILE

SHEET NO. 17 OF 40

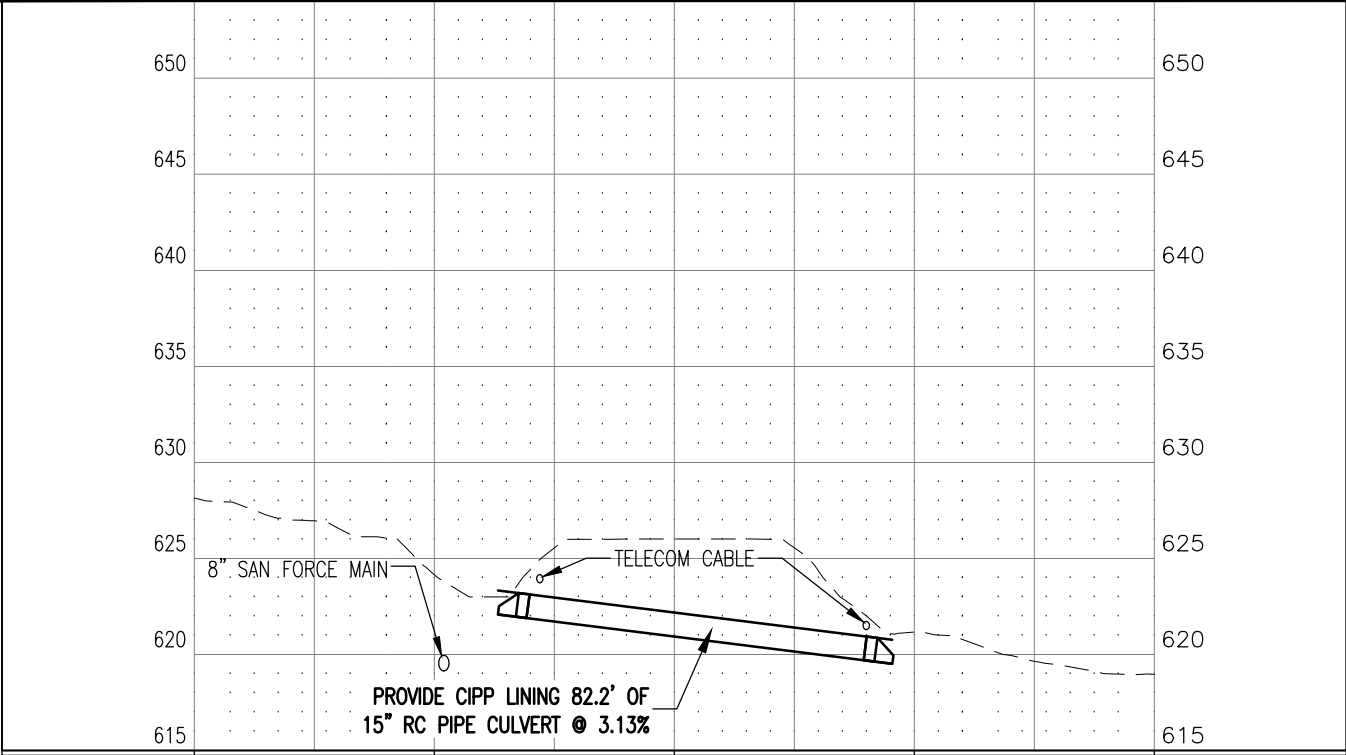




CULVERT 16 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	35
2503.603	15" CIPP LINER STORM CULVERT	LF	82
2574.508	FERTILIZER TYPE 3	POUND	3
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	67



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 16

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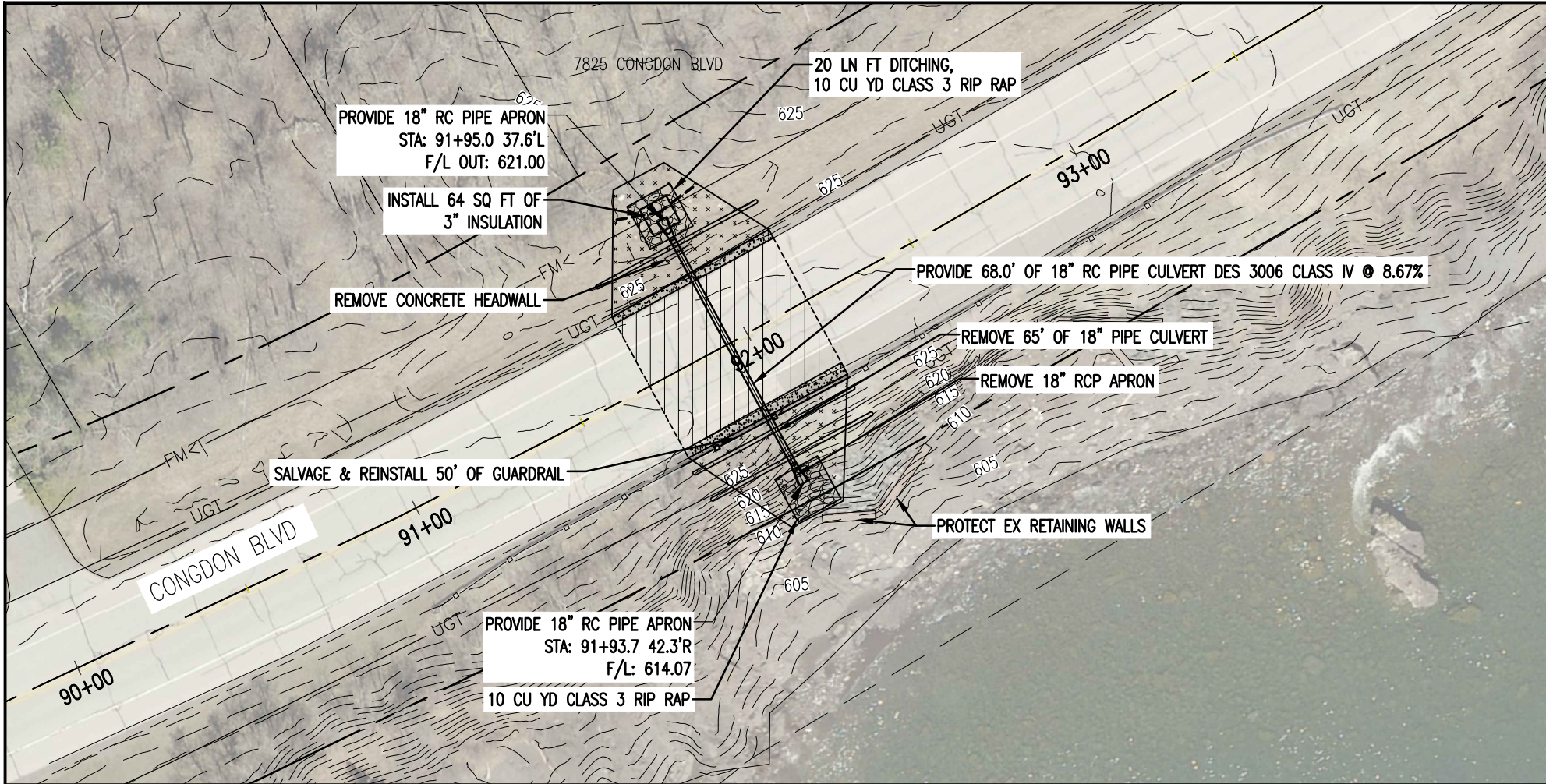
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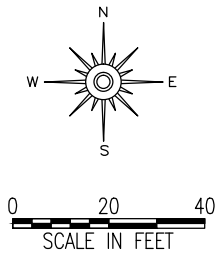
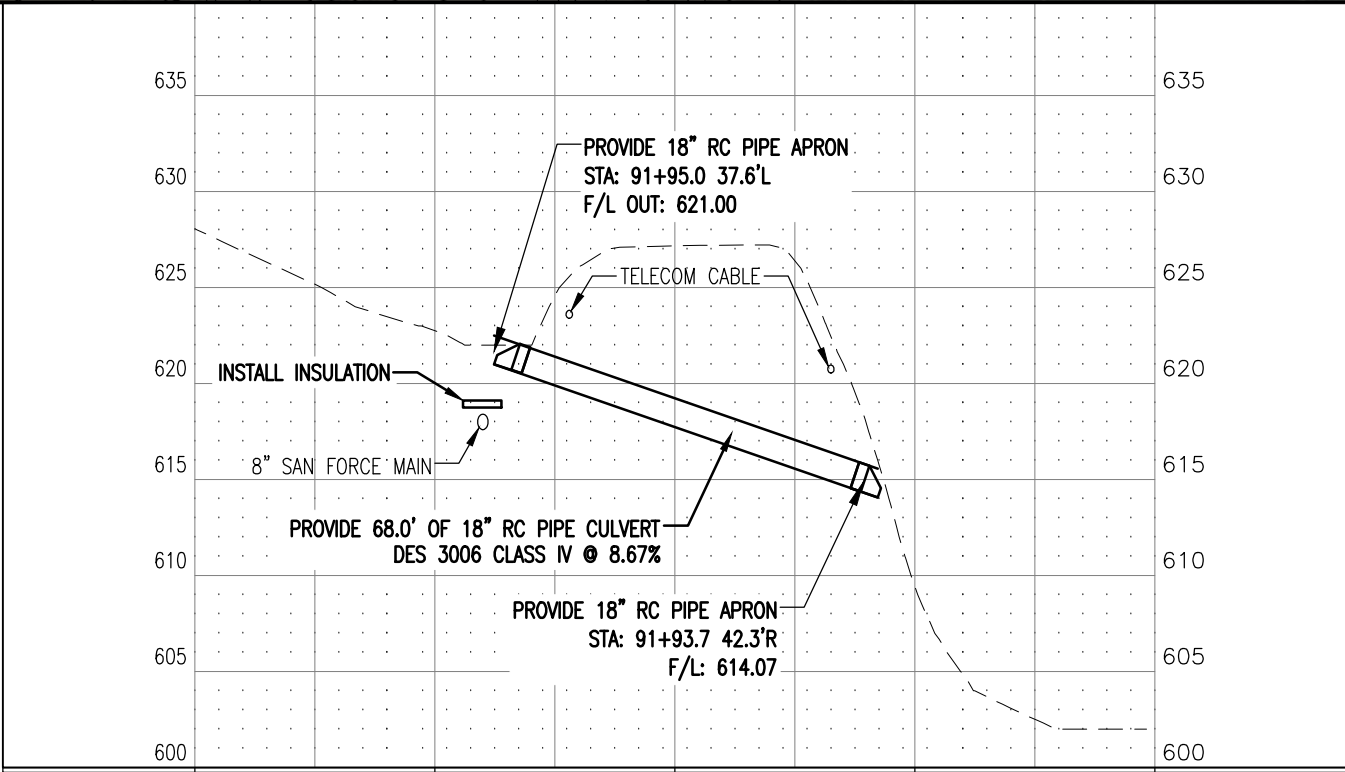
CULVERT 16 PLAN & PROFILE

SHEET NO. 18 OF 40





CULVERT 17 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.501	REMOVE CONCRETE CULVERT	LF	65
2104.505	REMOVE CONCRETE PAVEMENT	SY	96
2104.505	REMOVE BITUMINOUS PAVEMENT	SY	202
2104.509	REMOVE HEADWALL	EACH	1
2104.509	REMOVE CONCRETE APRON	EACH	1
2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LF	80
2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LF	36
2105.603	DITCHING	LF	20
2211.503	AGGREGATE BASE (CV) CLASS 5	CY	64
2301.504	CONCRETE PAVEMENT 6"	SQ YD	96
2301.602	DRILL & GROUT REINF BAR (EPOXY COATED)	EACH	16
2360.501	TYPE SP 9.5 WEARING COURSE MIX (3,B)	TON	59
2360.502	TYPE SP 12.5 NON WEAR COURSE MIX (3,B)	TON	72
2501.561	18" RCP PIPE CULVERT DES 3006 CL IV	LF	68
2501.515	18" RCP PIPE APRON	EACH	2
2504.604	3" POLYSTYRENE INSULATION	SQ YD	7
2511.501	RANDOM RIPRAP CLASS III	CY	20
2554.603	SALVAGE & INSTALL GUARDRAIL	LF	50
2573.533	SEDIMENT CONTROL LOG TYPE STRAW	LF	150
2574.508	FERTILIZER TYPE 3	POUND	7
2574.525	COMMON TOPSOIL BORROW (LV)	CY	2
2575.501	SEEDING	ACRE	0.03
2575.502	SEED MIXTURE 25-141	POUND	3
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	169
2582.502	4" SOLID LINE PAINT	LF	96
2582.502	4" DBLE SOLID LINE PAINT	LF	48



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION

CULVERT 17

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: 3/8/2016  
LIC. NO: 22442



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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

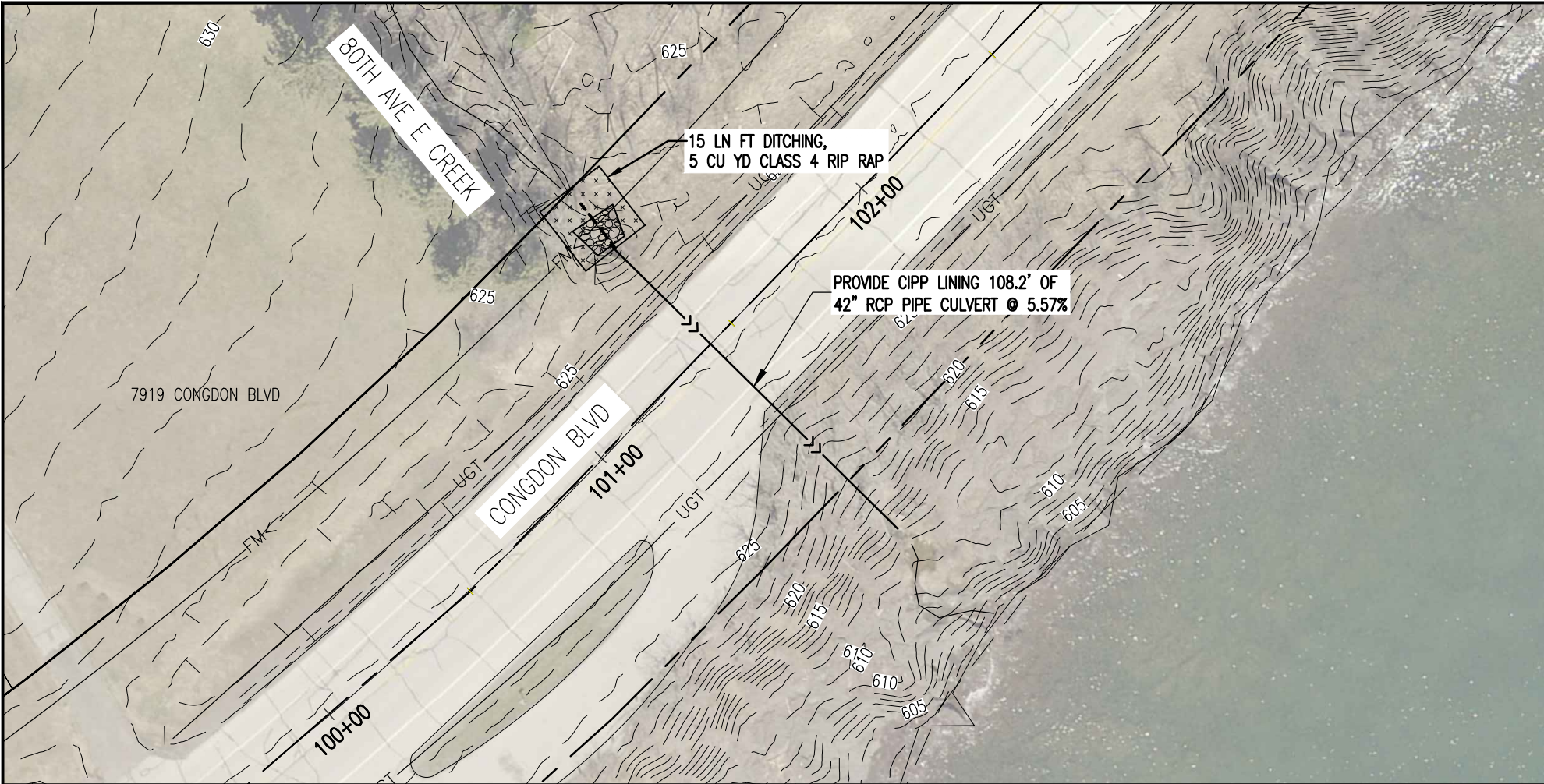
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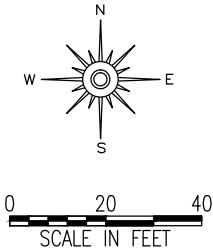
CULVERT 17 PLAN & PROFILE

SHEET NO. 19 OF 40

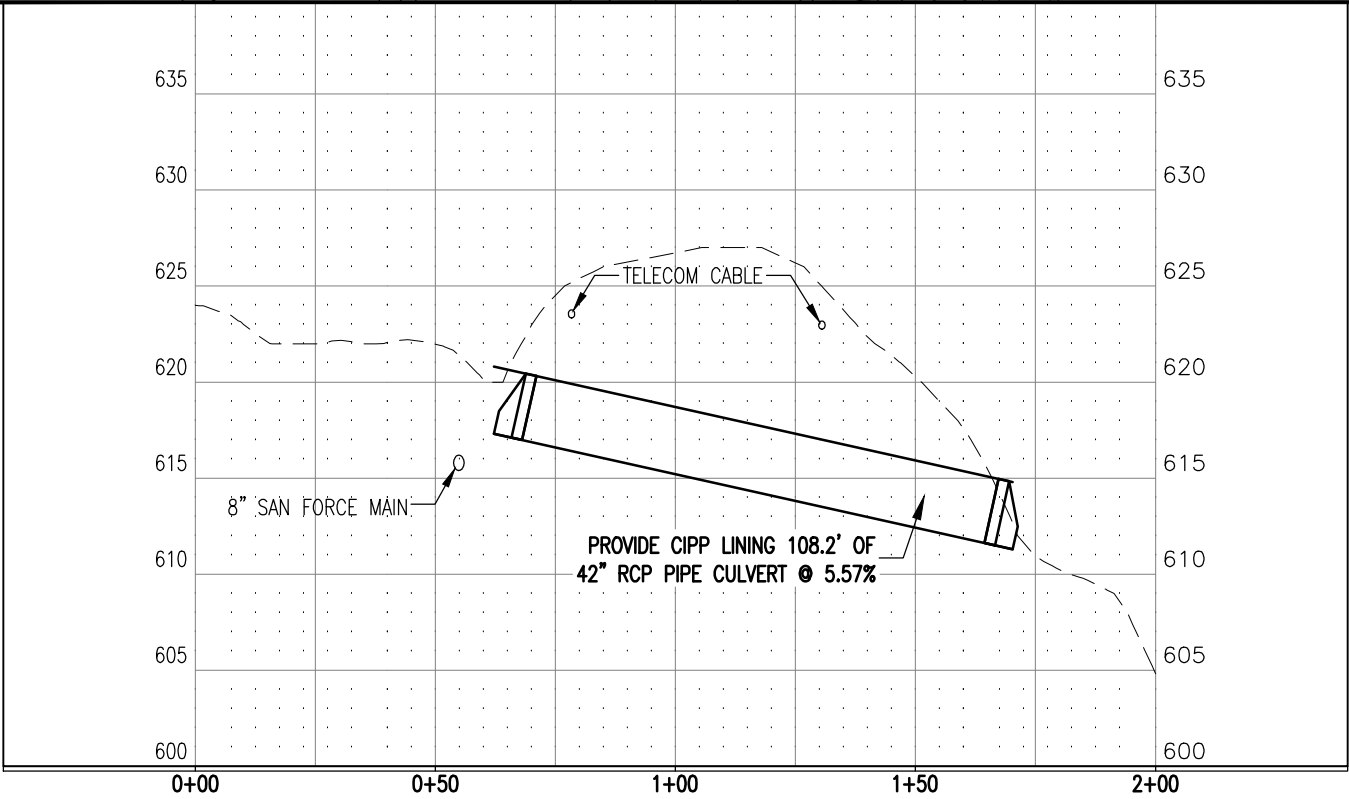




CULVERT 19 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	15
2503.603	42" CIPP LINER STORM CULVERT	LF	108
2511.501	RANDOM RIPRAP CLASS IV	CY	5
2574.508	FERTILIZER TYPE 3	POUND	2
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	44



- LEGEND**
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 19

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: 3/8/2016  
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CITY OF DULUTH  
ENGINEERING DIVISION  
411 W. 1ST ST. STE. 211  
DULUTH, MN 55802

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

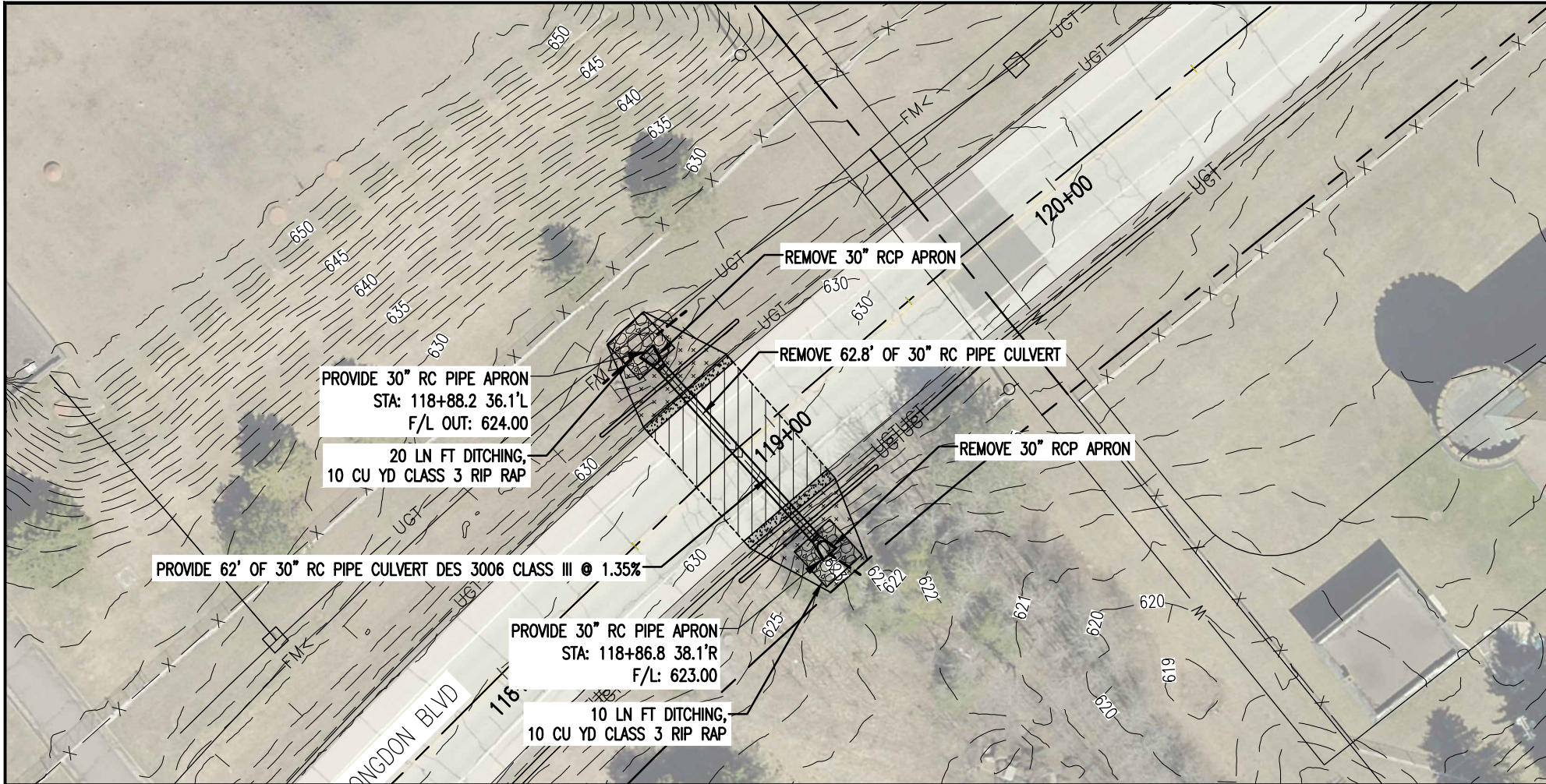
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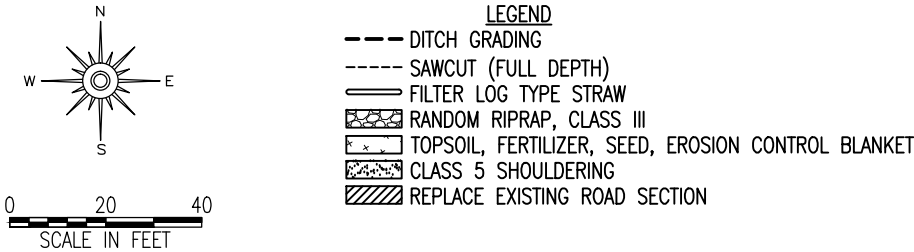
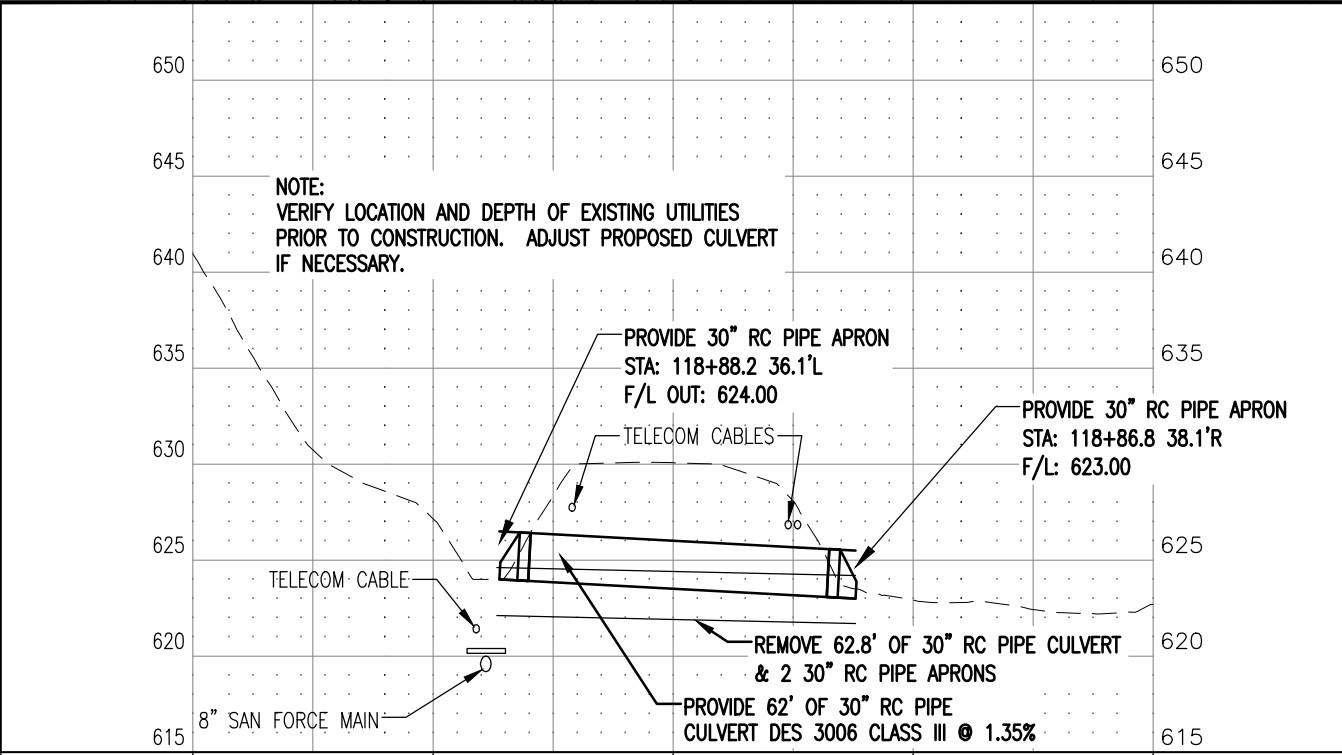
CULVERT 19 PLAN & PROFILE

SHEET NO. 20 OF 40





CULVERT 23 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.501	REMOVE CONCRETE CULVERT	LF	63
2104.505	REMOVE CONCRETE PAVEMENT	SY	60
2104.505	REMOVE BITUMINOUS PAVEMENT	SY	127
2104.509	REMOVE CONCRETE APRON	EACH	2
2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LF	80
2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH)	LF	36
2105.603	DITCHING	LF	30
2211.503	AGGREGATE BASE (CV) CLASS 5	CY	40
2301.504	CONCRETE PAVEMENT 6"	SQ YD	60
2301.602	DRILL & GROUT REINF BAR (EPOXY COATED)	EACH	16
2360.501	TYPE SP 9.5 WEARING COURSE MIX (3,B)	TON	16
2360.502	TYPE SP 12.5 NON WEAR COURSE MIX (3,B)	TON	28
2501.561	30" RCP PIPE CULVERT DES 3006 CL III	LF	62
2501.515	30" RCP PIPE APRON	EACH	2
2511.501	RANDOM RIPRAP CLASS III	CY	20
2573.533	SEDIMENT CONTROL LOG TYPE STRAW	LF	100
2574.508	FERTILIZER TYPE 3	POUND	7
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.03
2575.502	SEED MIXTURE 25-141	POUND	2
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	156
2582.502	4" SOLID LINE PAINT	LF	60
2582.502	4" DBLE SOLID LINE PAINT	LF	30



CULVERT 23

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: 3/8/2016  
LIC. NO.: 22442



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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

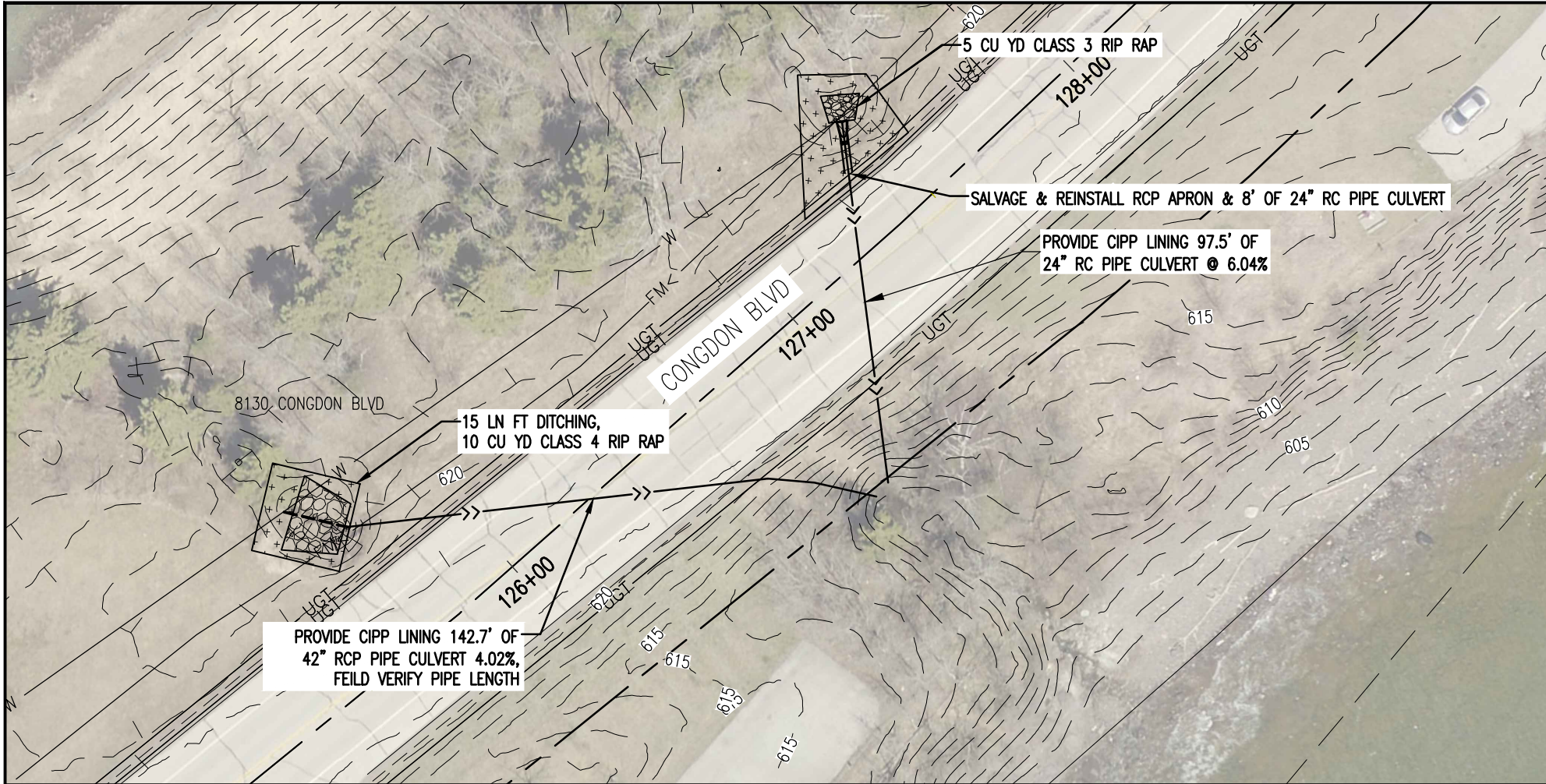
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DRAWN BY: JJM

CULVERT 23 PLAN & PROFILE

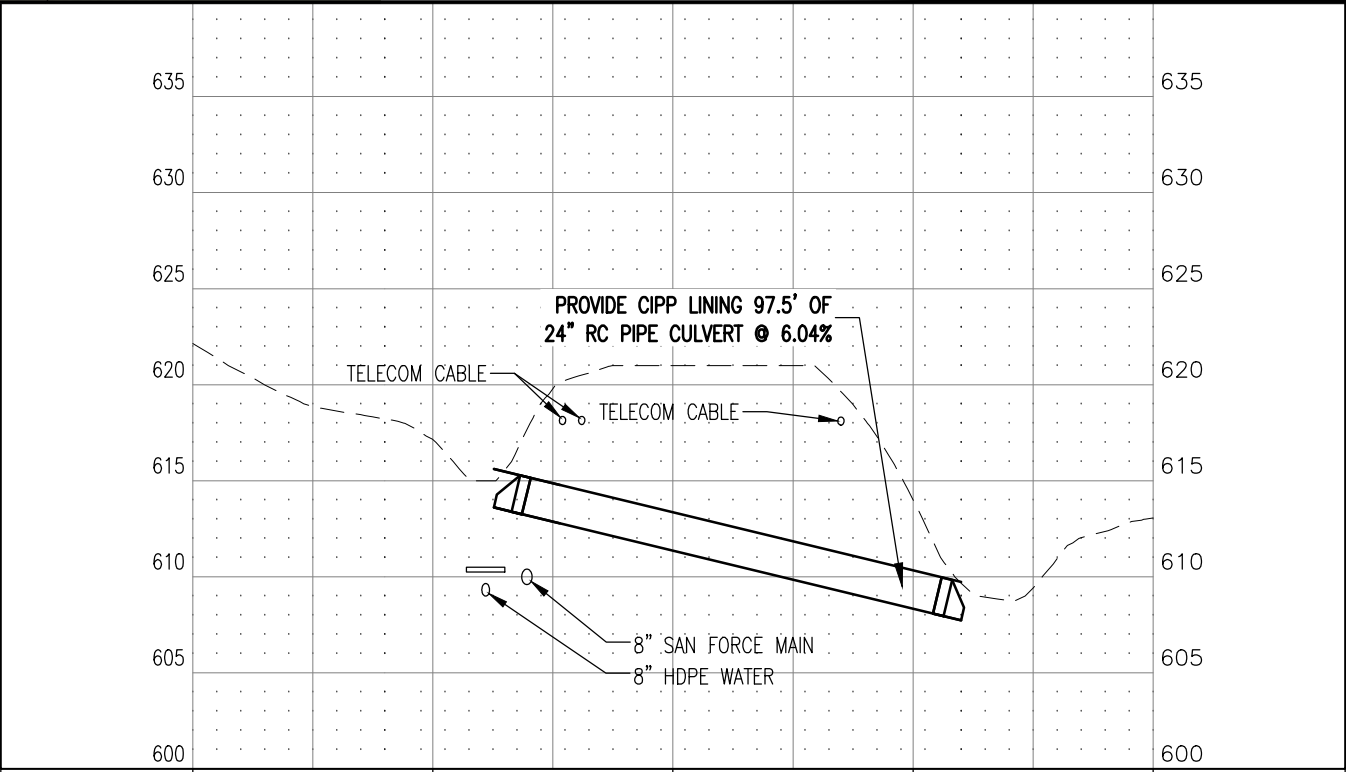
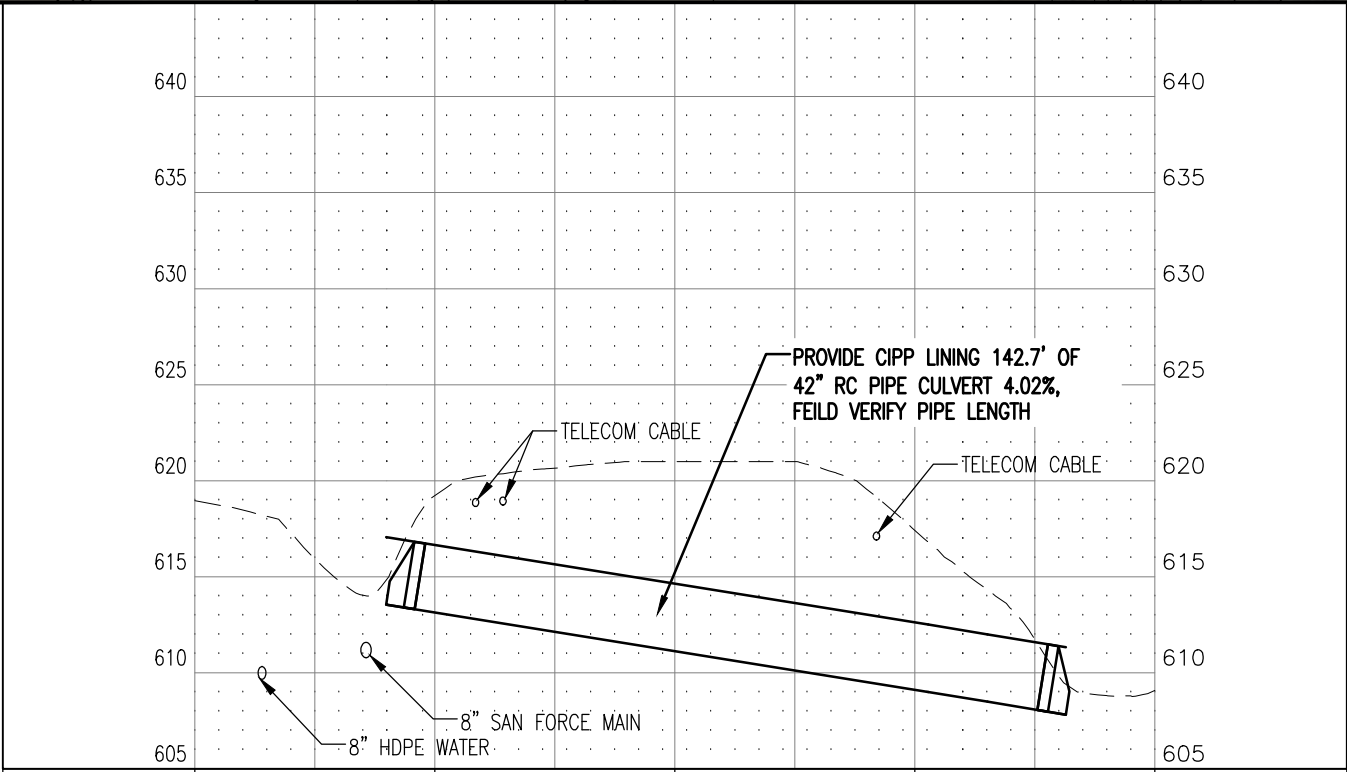
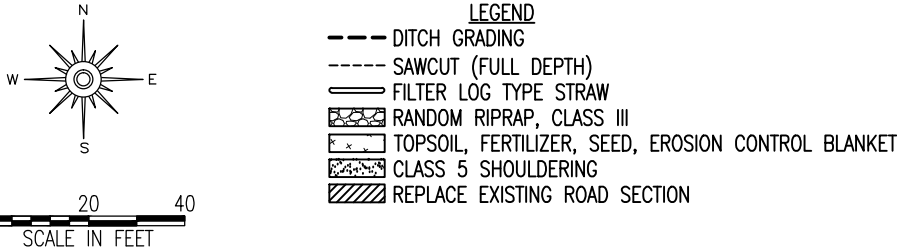
SHEET NO. 21 OF 40





CULVERT 25A ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	15
2503.603	42" CIPP LINER STORM CULVERT	LF	143
2511.501	RANDOM RIPRAP CLASS IV	CY	10
2574.508	FERTILIZER TYPE 3	POUND	2
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	45

CULVERT 25B ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.521	SALVAGE PIPE CULVERT	LF	8
2104.523	SALVAGE PIPE APRON	EACH	1
2501.571	INSTALL PIPE CULVERT (24" RCP)	LF	8
2501.573	INSTALL PIPE APRON	EACH	1
2503.603	24" CIPP LINER STORM CULVERT	LF	98
2511.501	RANDOM RIPRAP CLASS III	CY	5
2574.508	FERTILIZER TYPE 3	POUND	3
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	70



CULVERT 25A

CULVERT 25B

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: 3/8/2016  
LIC. NO: 22442



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

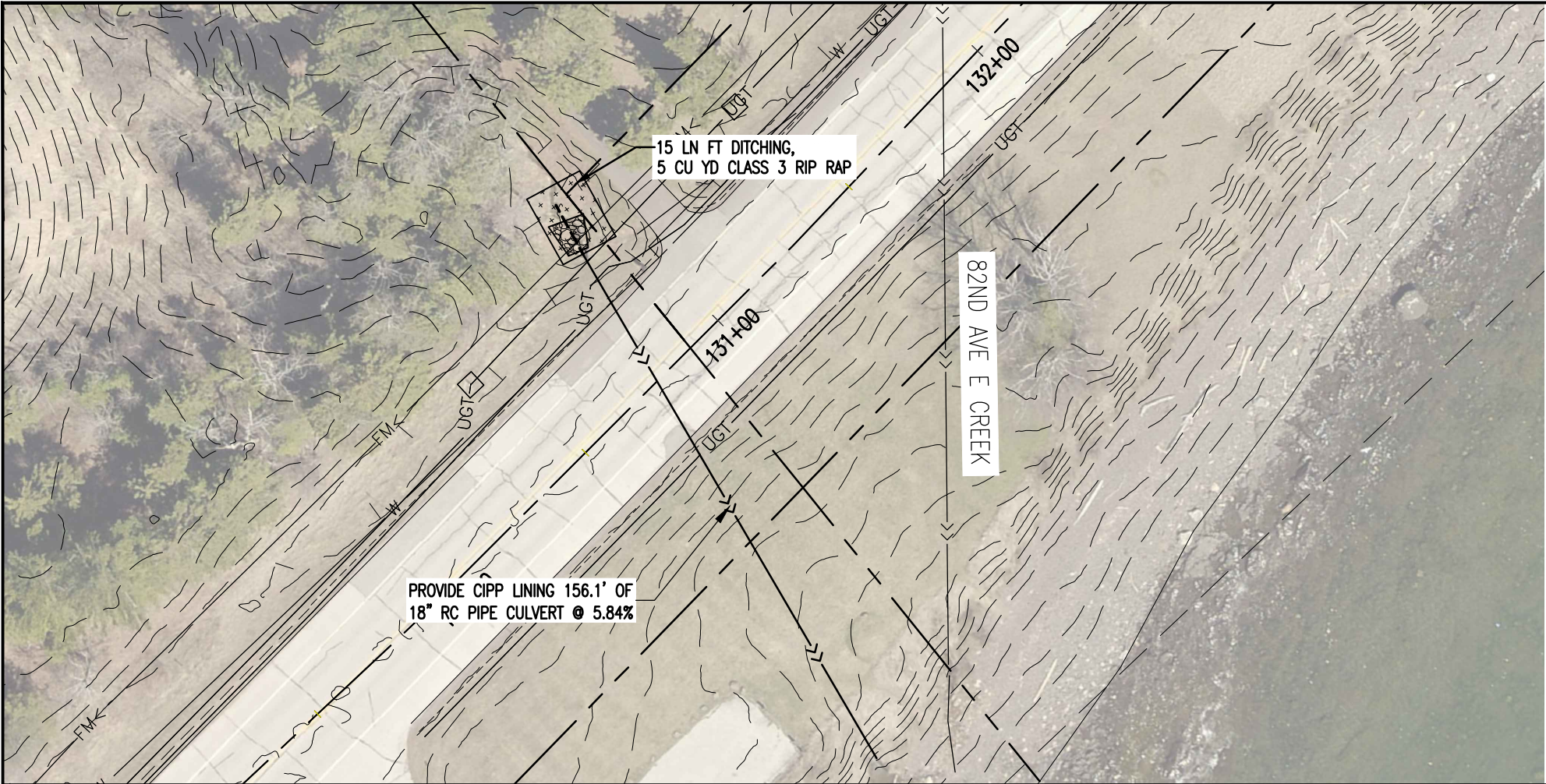
CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

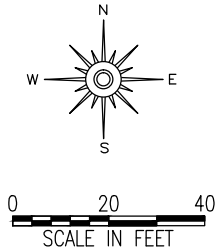
STATE AID PROJECT NO.: NA

DRAWN BY: JJM  
CULVERT 25A & 25B PLAN & PROFILE  
SHEET NO. 22 OF 40

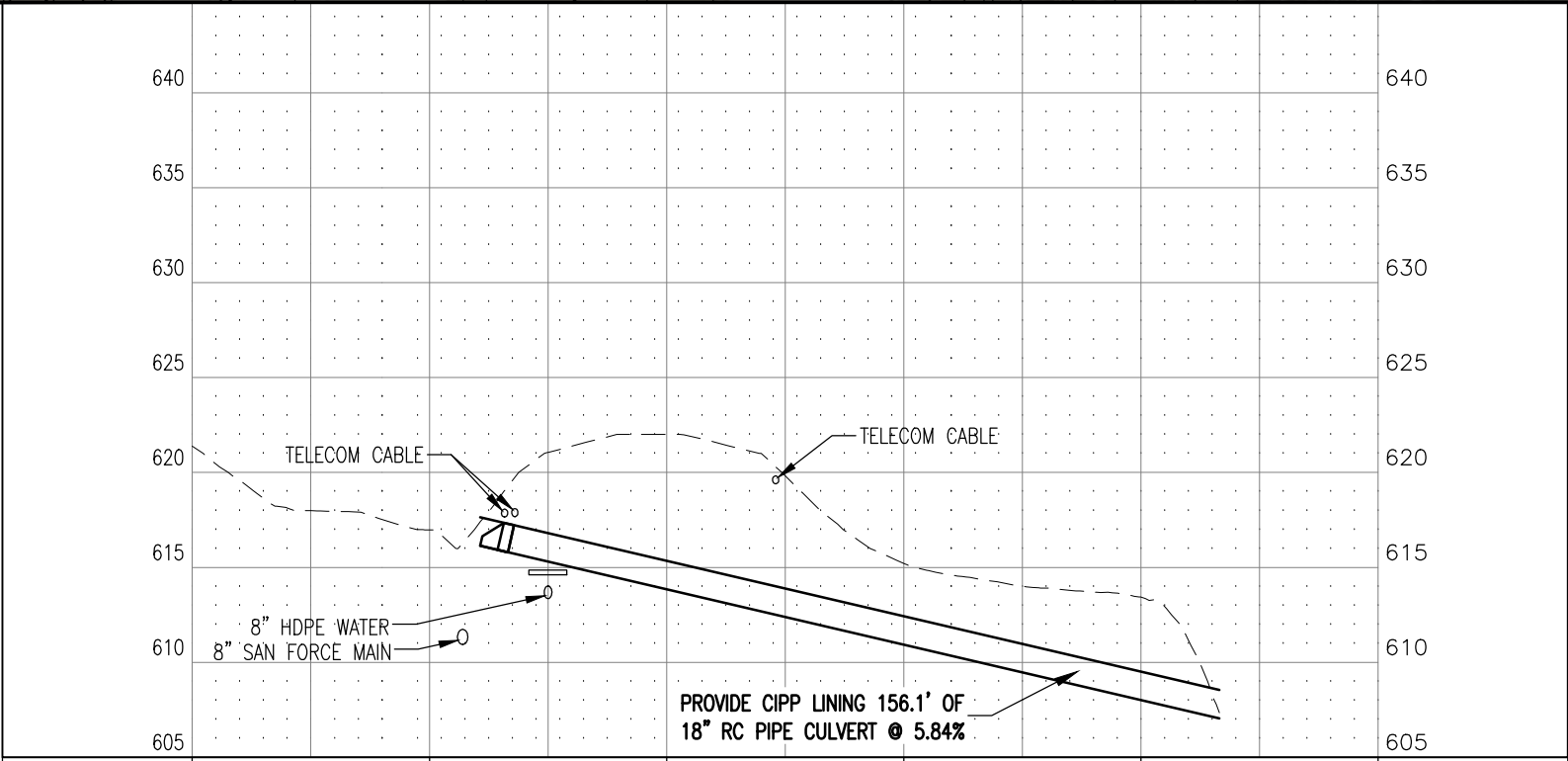




CULVERT 26A ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	15
2503.603	18" CIPP LINER STORM CULVERT	LF	156
2511.501	RANDOM RIPRAP CLASS III	CY	5
2574.508	FERTILIZER TYPE 3	POUND	2
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	33



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 26A

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

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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

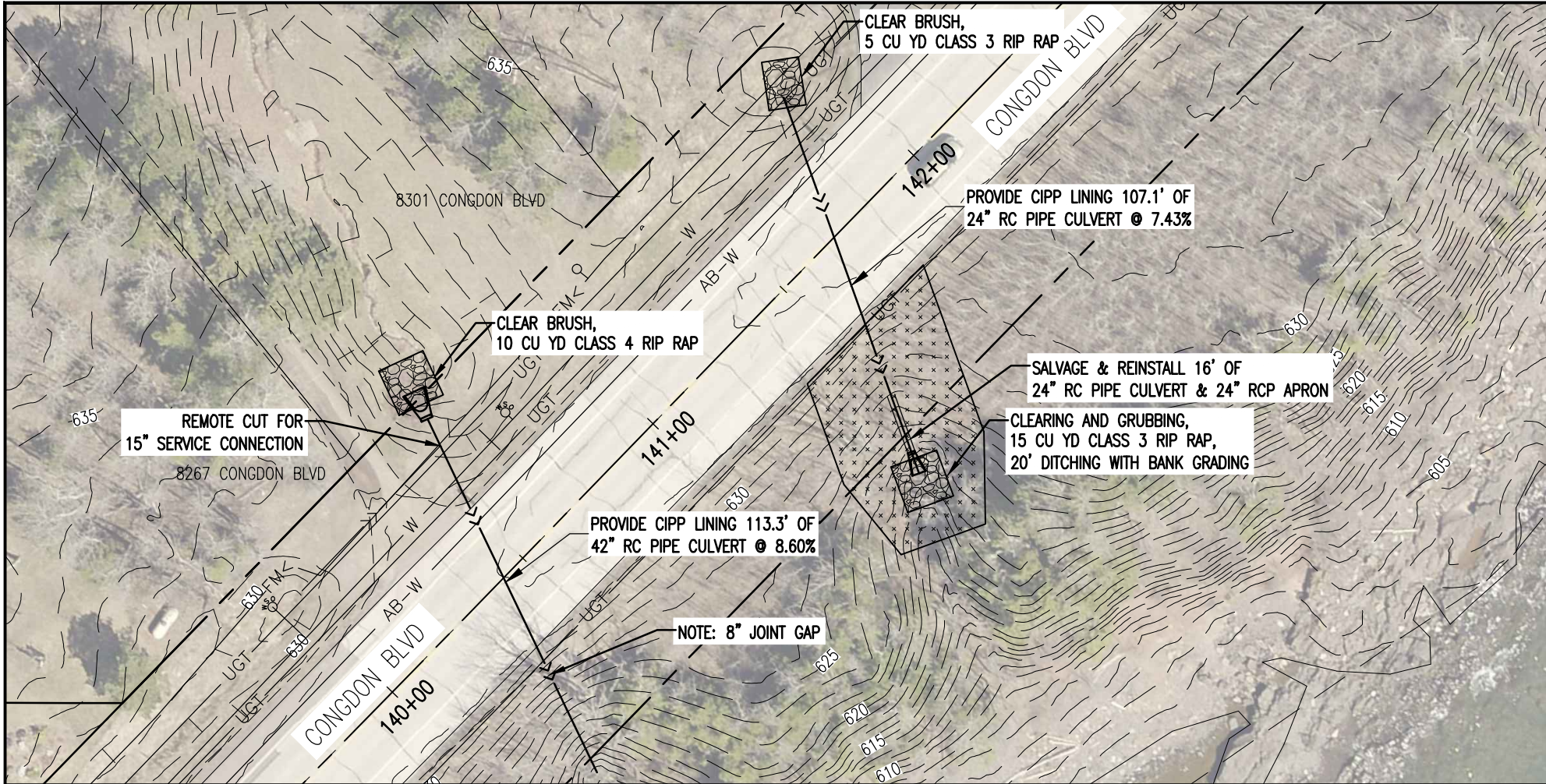
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DRAWN BY: JJM

CULVERT 26A PLAN & PROFILE

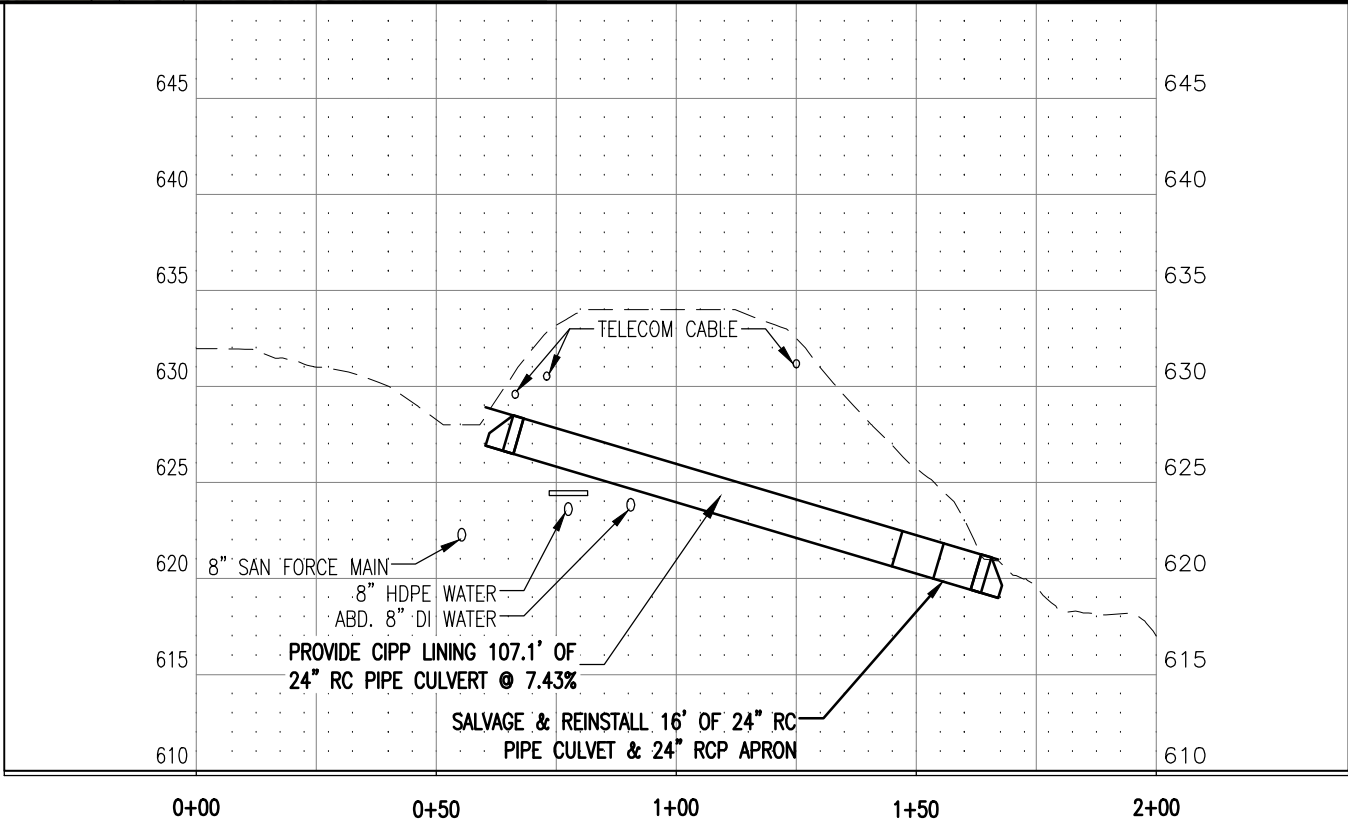
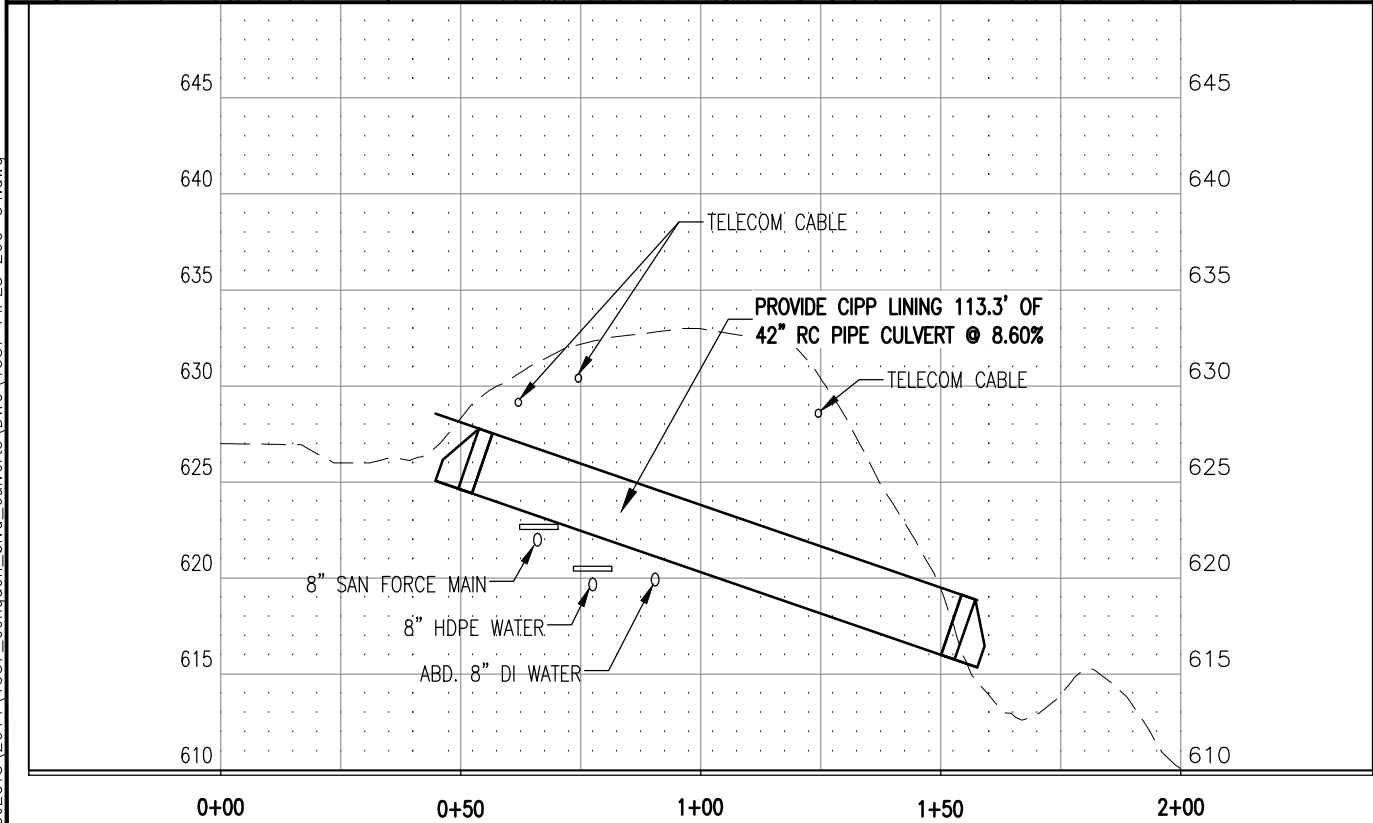
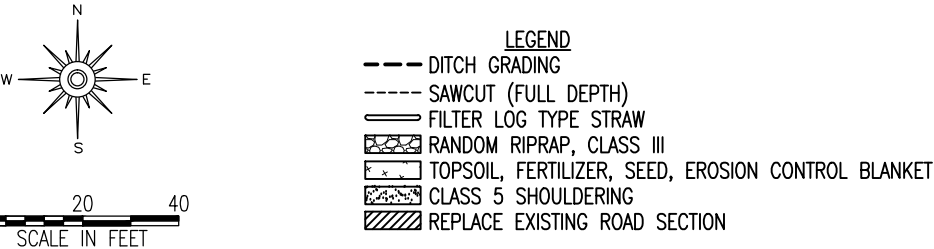
SHEET NO. 23 OF 40





CULVERT 26C ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2503.602	REMOTE CUT AND RECONNECT SERVICE	EACH	1
2503.603	42" CIPP LINER STORM CULVERT	LF	113
2511.501	RANDOM RIPRAP CLASS IV	CY	10

CULVERT 27 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.521	SALVAGE PIPE CULVERT	LF	16
2104.523	SALVAGE PIPE APRON	EACH	1
2501.571	INSTALL PIPE CULVERT (24" RCP)	LF	16
2501.573	INSTALL PIPE APRON	EACH	1
2503.603	24" CIPP LINER STORM CULVERT	LF	107
2511.501	RANDOM RIPRAP CLASS III	CY	20
2574.508	FERTILIZER TYPE 3	POUND	10
2574.525	COMMON TOPSOIL BORROW (LV)	CY	2
2575.501	SEEDING	ACRE	0.05
2575.502	SEED MIXTURE 25-141	POUND	3
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	232



### CULVERT 26C

### CULVERT 27

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: 3/8/2016

LIC. NO: 22442



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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

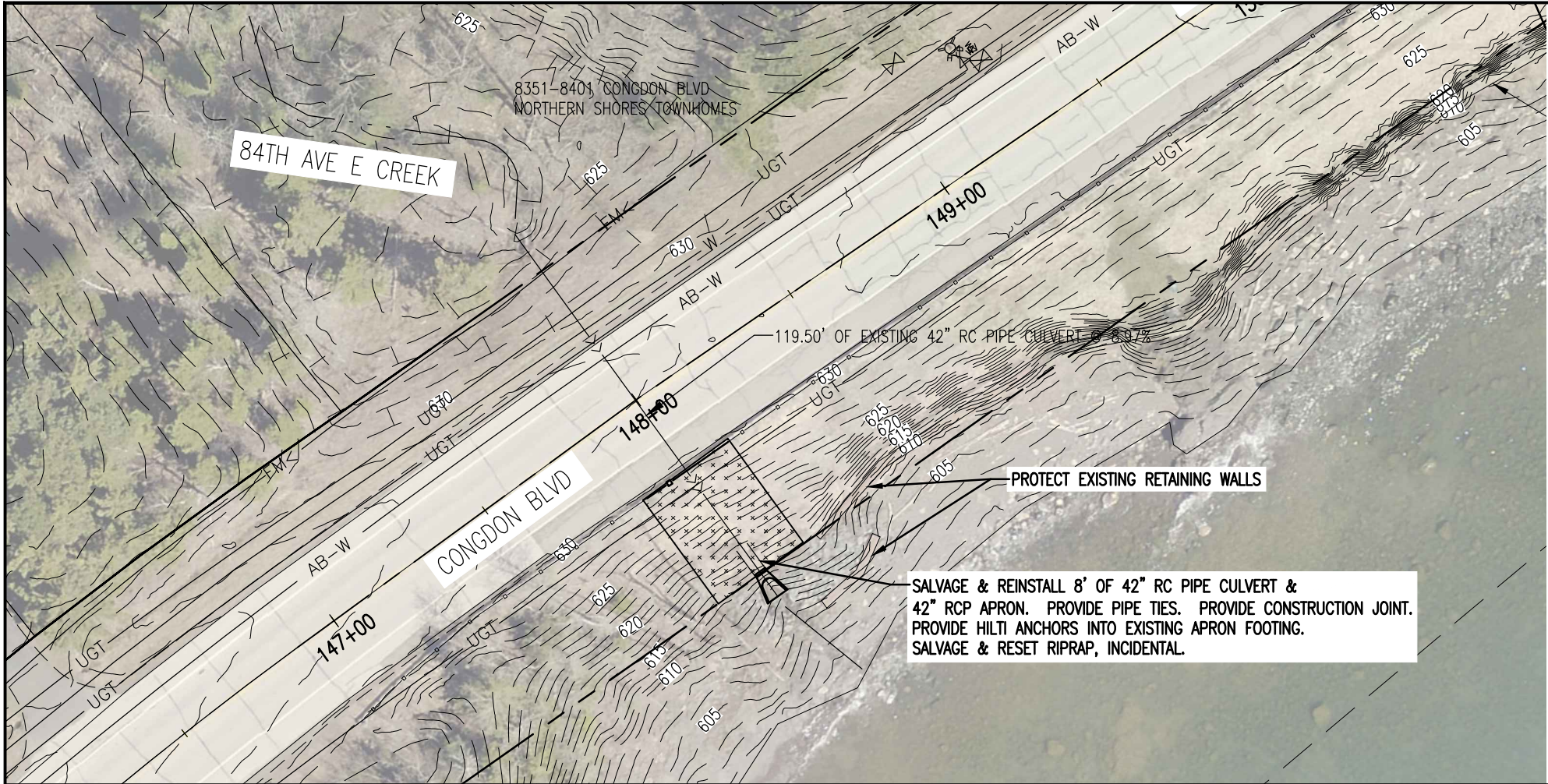
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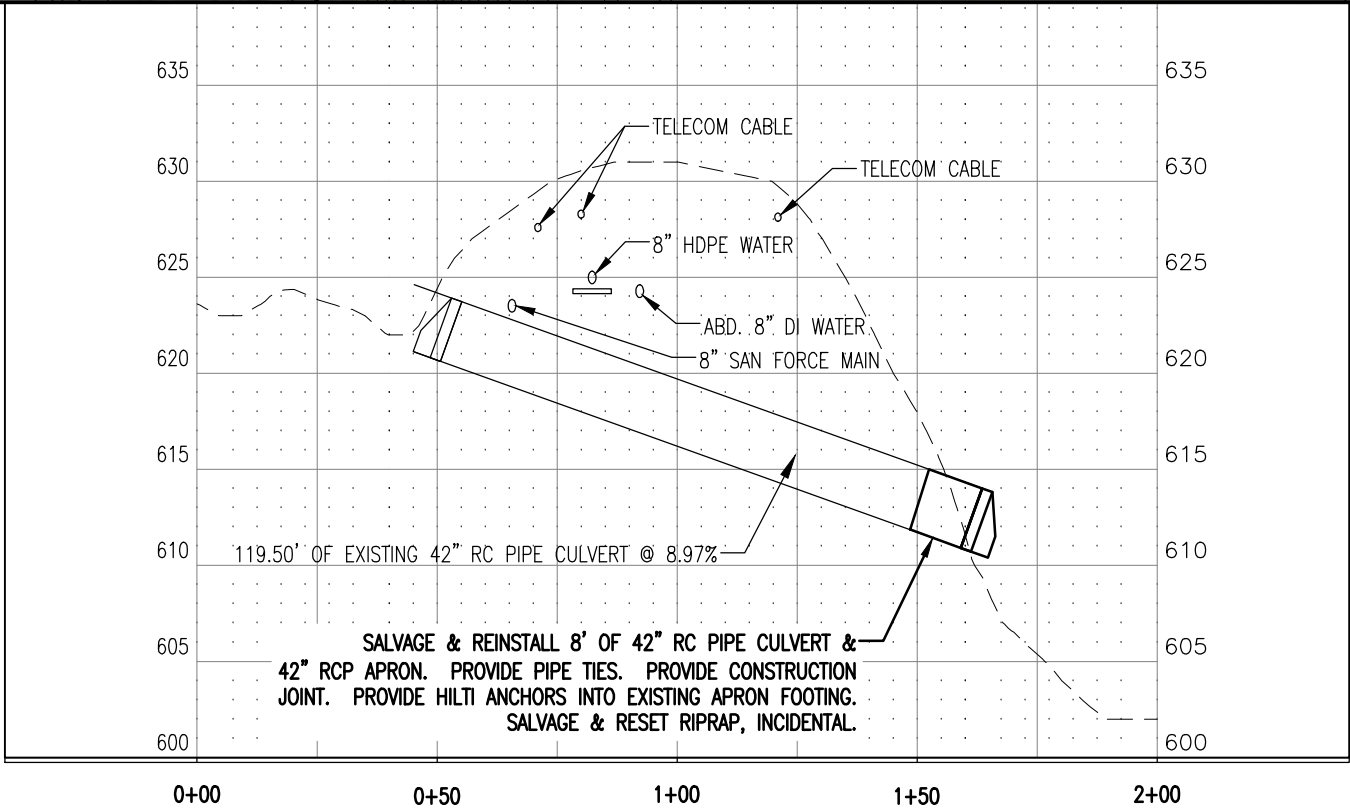
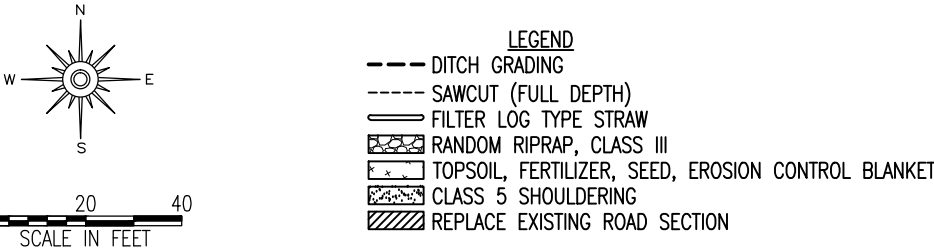
CULVERT 26C & 27 PLAN & PROFILE

SHEET NO. 24 OF 40





CULVERT 28 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.521	SALVAGE PIPE CULVERT	LF	8
2104.523	SALVAGE PIPE APRON	EACH	1
2411.601	DRILL & EPOXY REINF BAR FOOTING / APRON	LUMP SUM	1
2501.571	INSTALL PIPE CULVERT (42" RCP)	LF	8
2501.573	INSTALL PIPE APRON	EACH	1
2503.602	CONSTRUCTION JOINT, 42" RC PIPE	EACH	1
2554.603	SALVAGE & INSTALL GUARDRAIL	LF	25
2574.508	FERTILIZER TYPE 3	POUND	5
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.02
2575.502	SEED MIXTURE 25-141	POUND	2
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	107



CULVERT 28

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: 3/8/2016  
LIC. NO.: 22442



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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

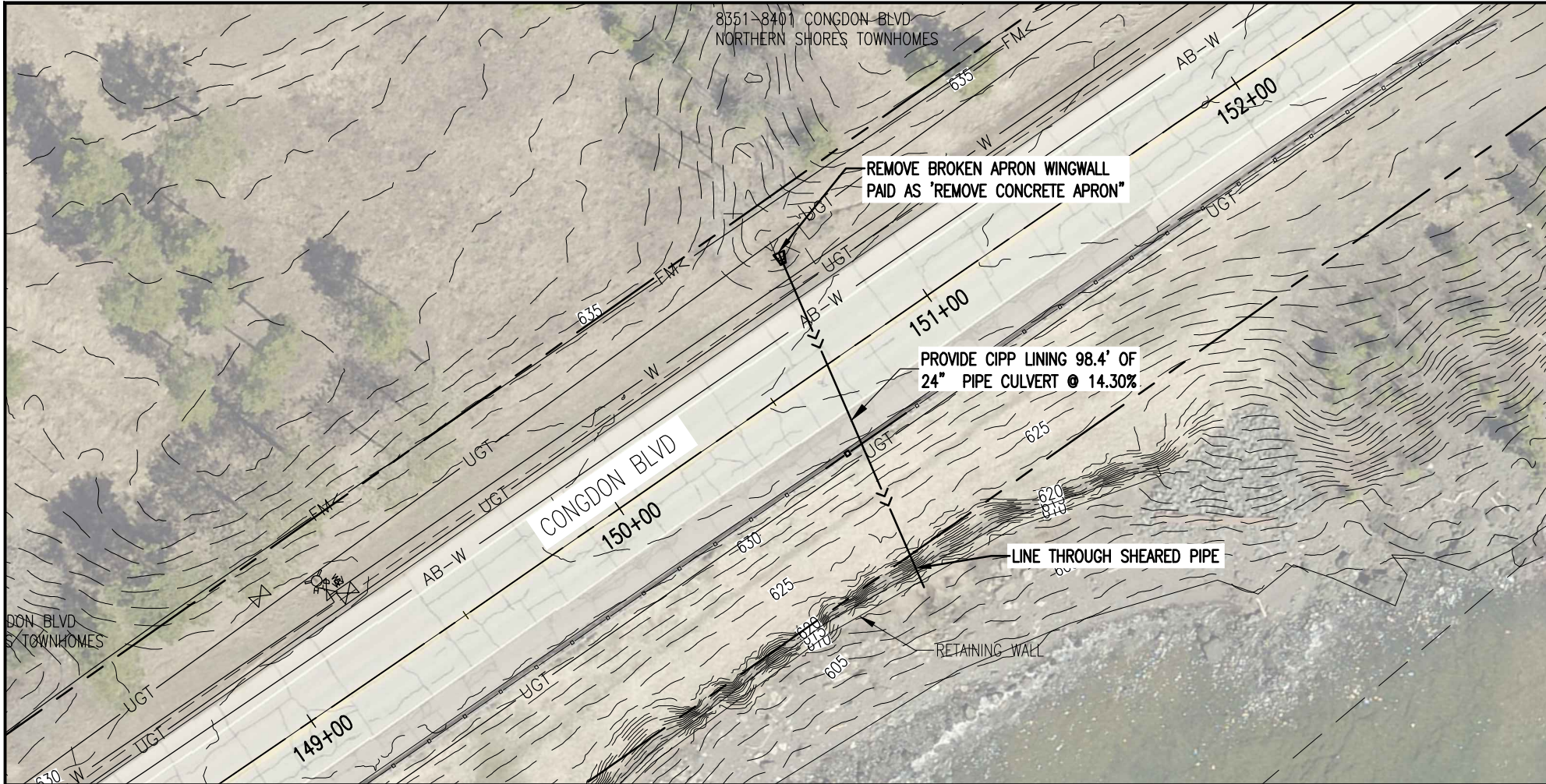
STATE AID PROJECT NO.: NA

DRAWN BY: JJM

CULVERT 28 PLAN & PROFILE

SHEET NO. 25 OF 40



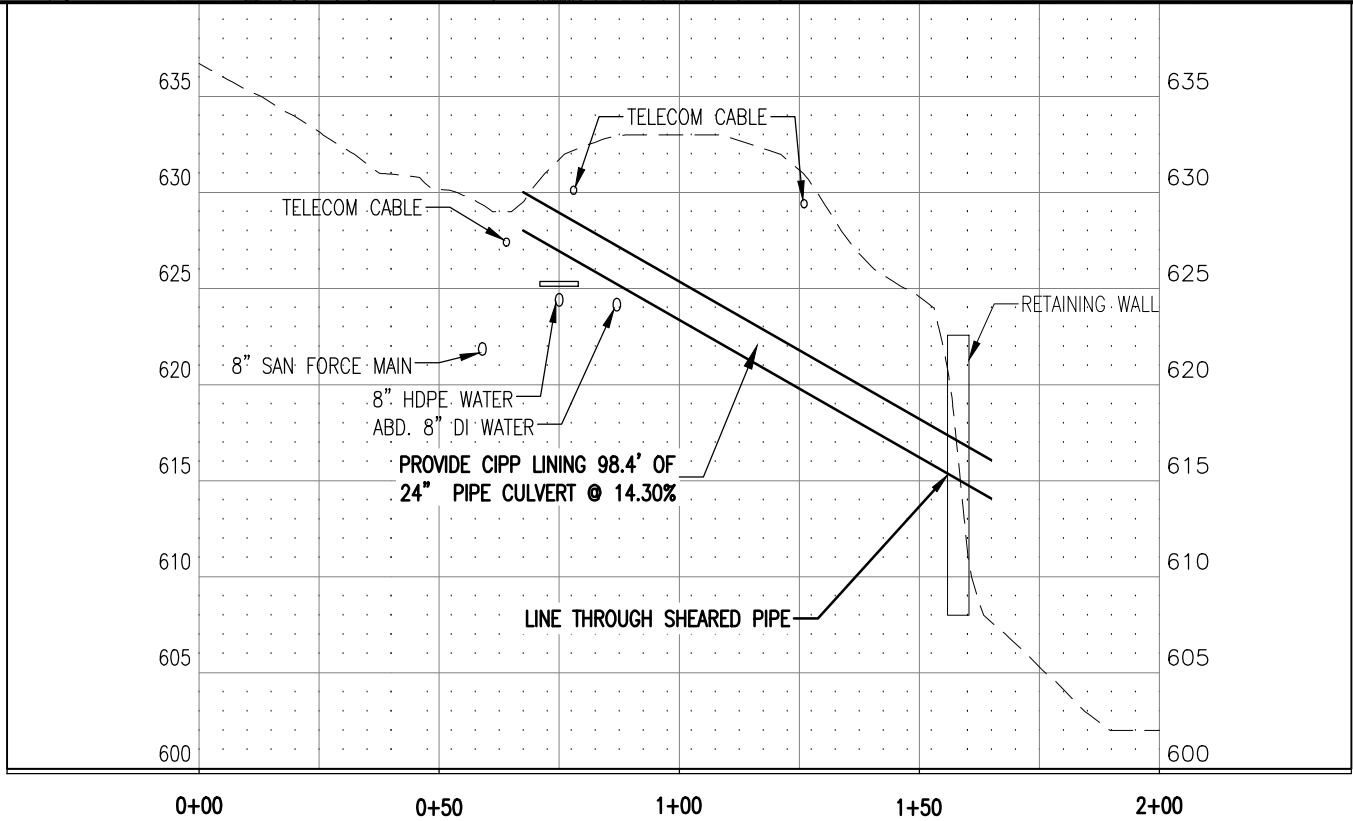


CULVERT 29 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2503.603	24" CIPP LINER STORM CULVERT	LF	98
2104.509	REMOVE CONCRETE APRON	EACH	1

SCALE IN FEET

**LEGEND**

- DITCH GRADING
- SAWCUT (FULL DEPTH)
- FILTER LOG TYPE STRAW
- [Pattern] RANDOM RIPRAP, CLASS III
- [Pattern] TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
- [Pattern] CLASS 5 SHOULDERING
- [Pattern] REPLACE EXISTING ROAD SECTION



CULVERT 29

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  
TYPE NAME

DATE: 3/8/2016  
LIC. NO: 22442



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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

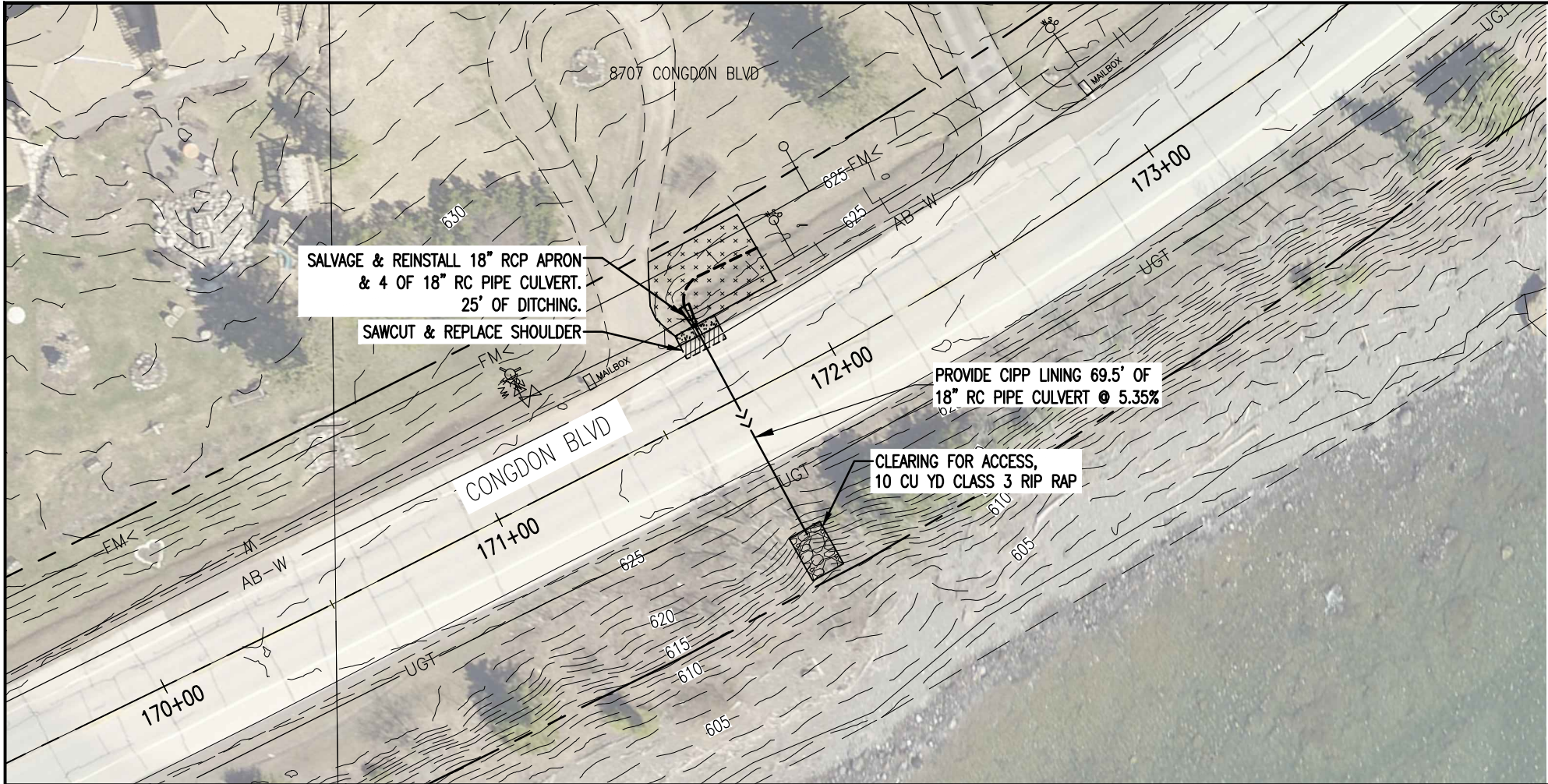
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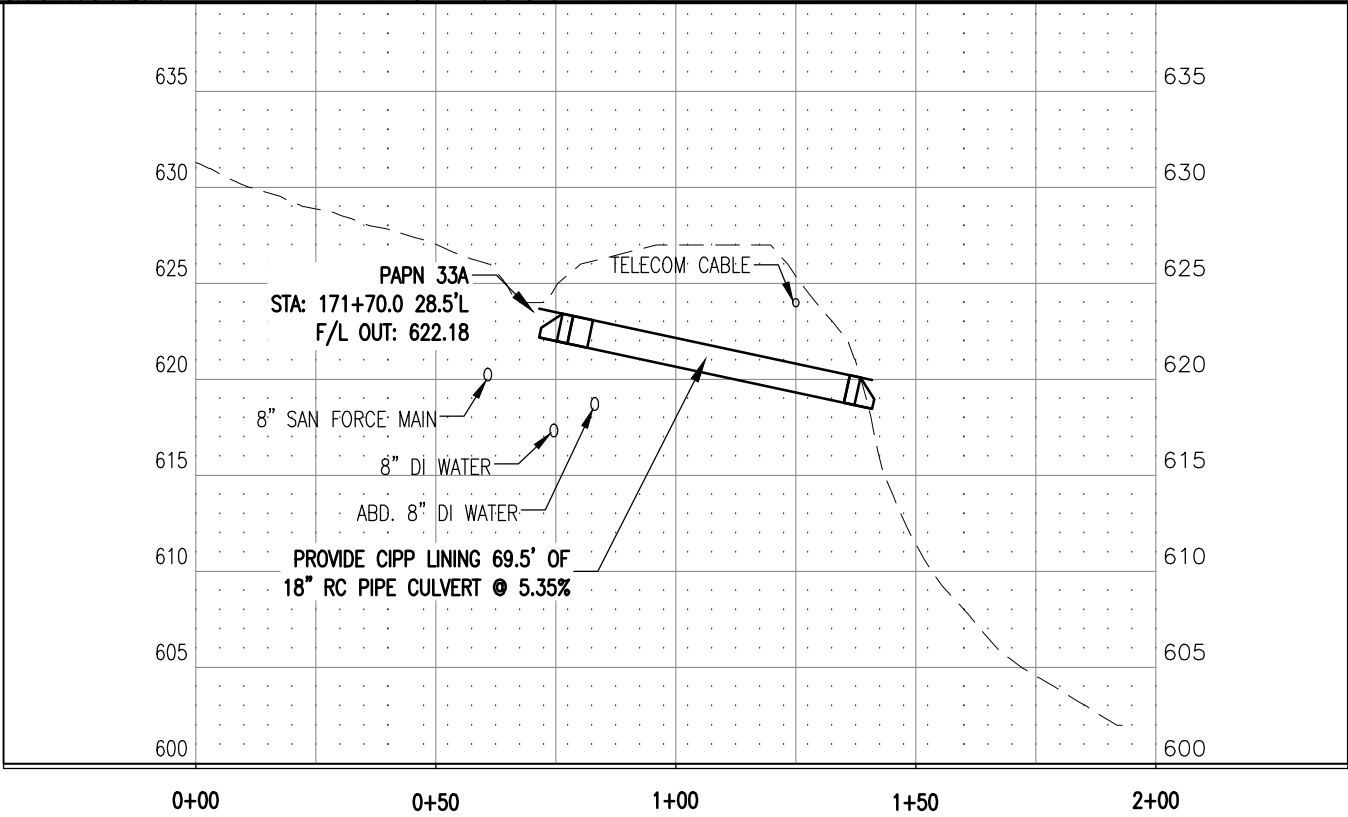
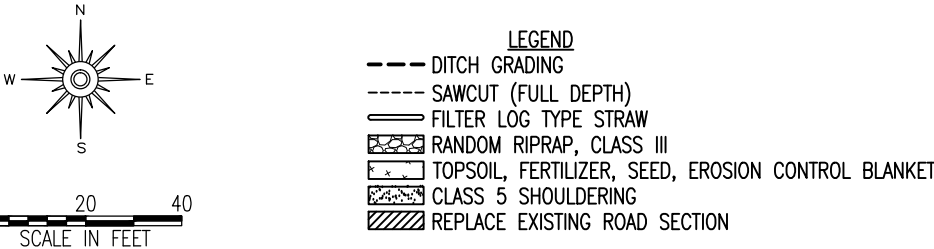
CULVERT 29 PLAN & PROFILE

SHEET NO. 26 OF 40





CULVERT 33 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.505	REMOVE BITUMINOUS PAVEMENT	SY	5
2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LF	20
2104.521	SALVAGE PIPE CULVERT	LF	4
2104.523	SALVAGE PIPE APRON	EACH	1
2105.603	DITCHING	LF	25
2211.503	AGGREGATE BASE (CV) CLASS 5	CY	5
2360.501	TYPE SP 9.5 WEARING COURSE MIX (3,B)	TON	1
2501.571	INSTALL PIPE CULVERT (18" RCP)	LF	4
2501.573	INSTALL PIPE APRON	EACH	1
2503.603	18" CIPP LINER STORM CULVERT	LF	70
2511.501	RANDOM RIPRAP CLASS III	CY	10
2574.508	FERTILIZER TYPE 3	POUND	3
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	71



CULVERT 33

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: 3/8/2016  
LIC. NO.: 22442



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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

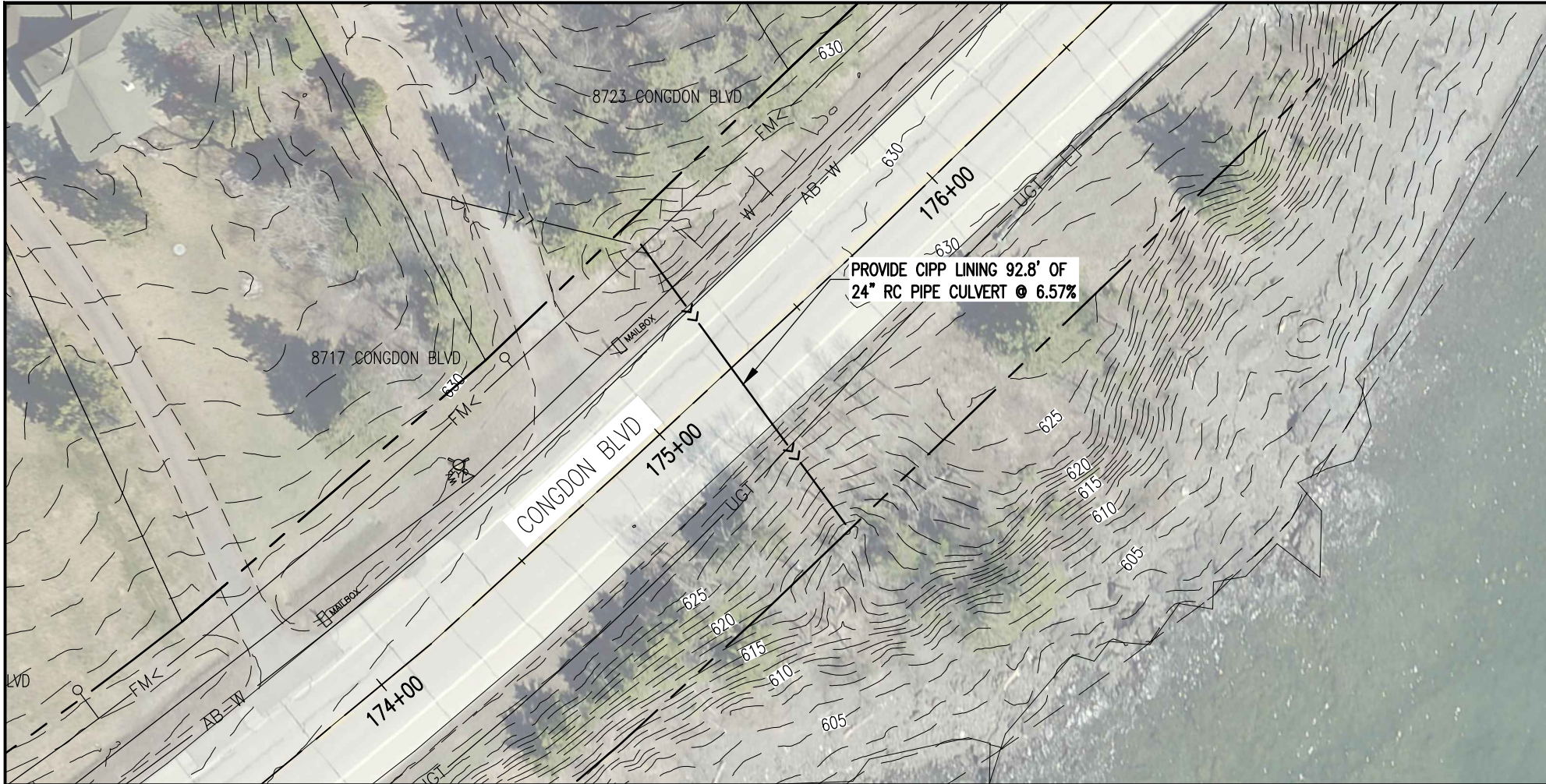
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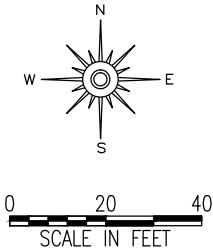
CULVERT 33 PLAN & PROFILE

SHEET NO. 27 OF 40

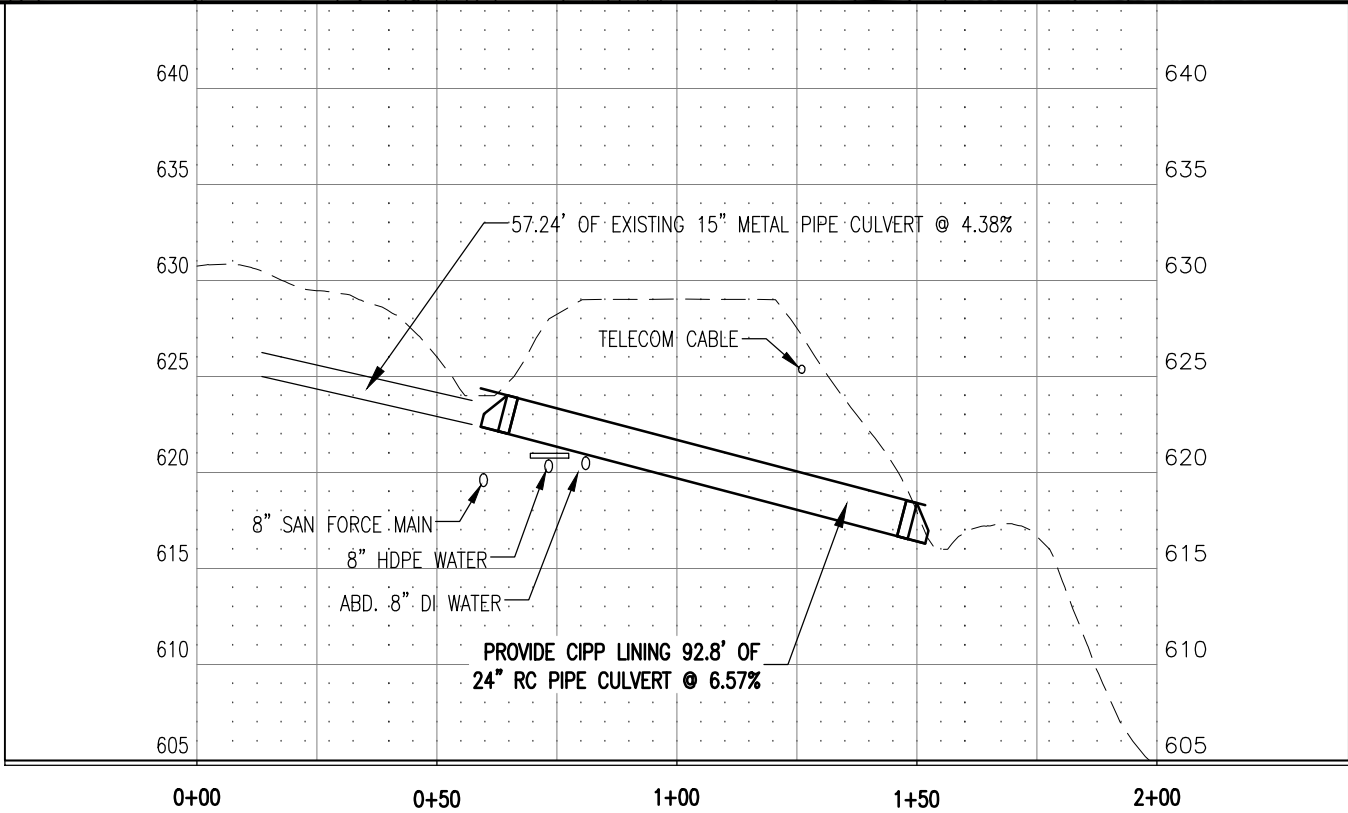




CULVERT 34 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2503.603	24" CIPP LINER STORM CULVERT	LF	93



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 34

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: 3/8/2016  
LIC. NO.: 22442



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DULUTH, MN 55802

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

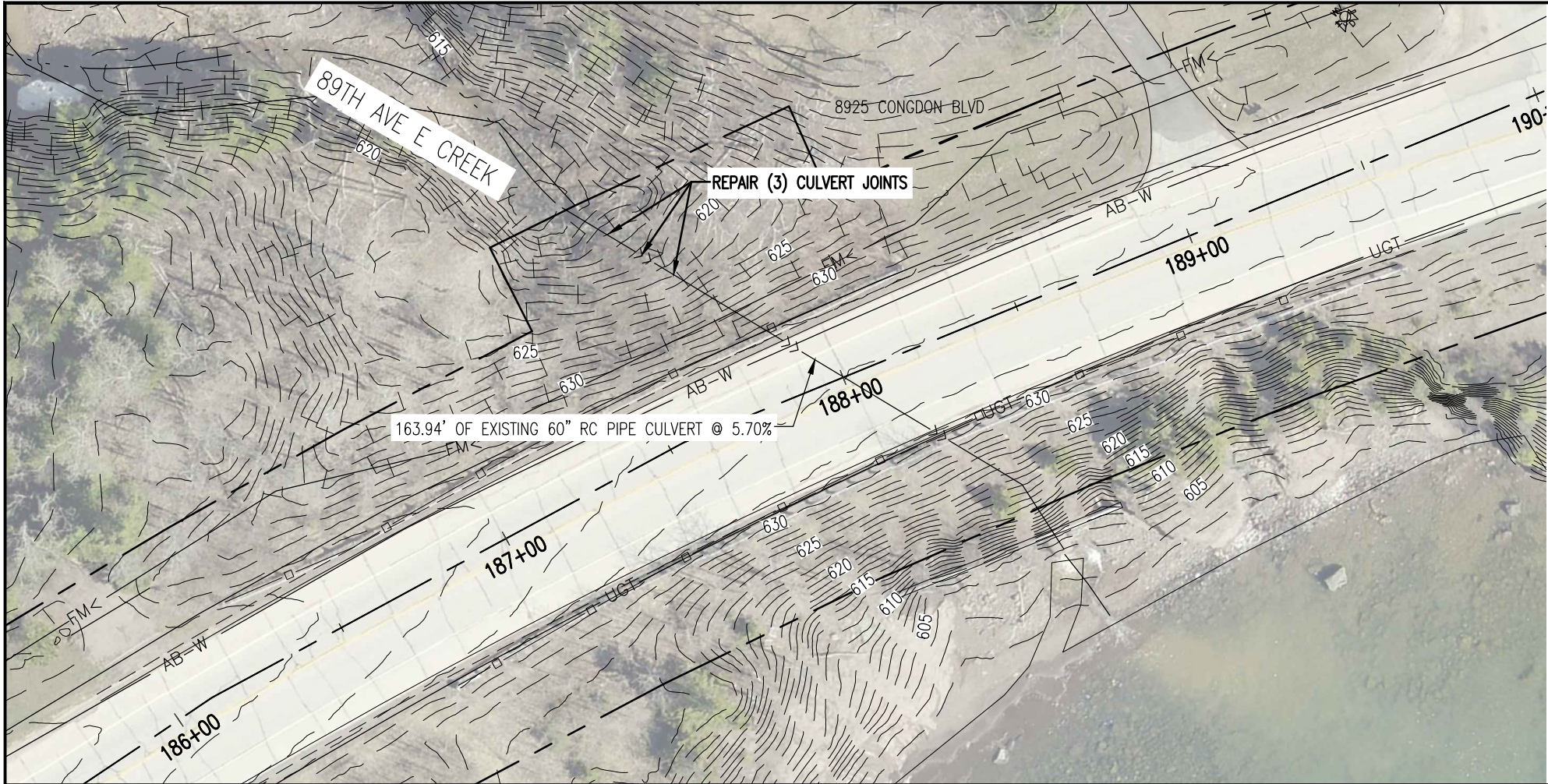
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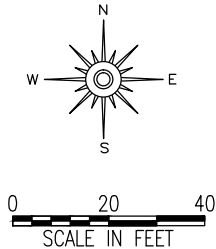
CULVERT 34 PLAN & PROFILE

SHEET NO. 28 OF 40

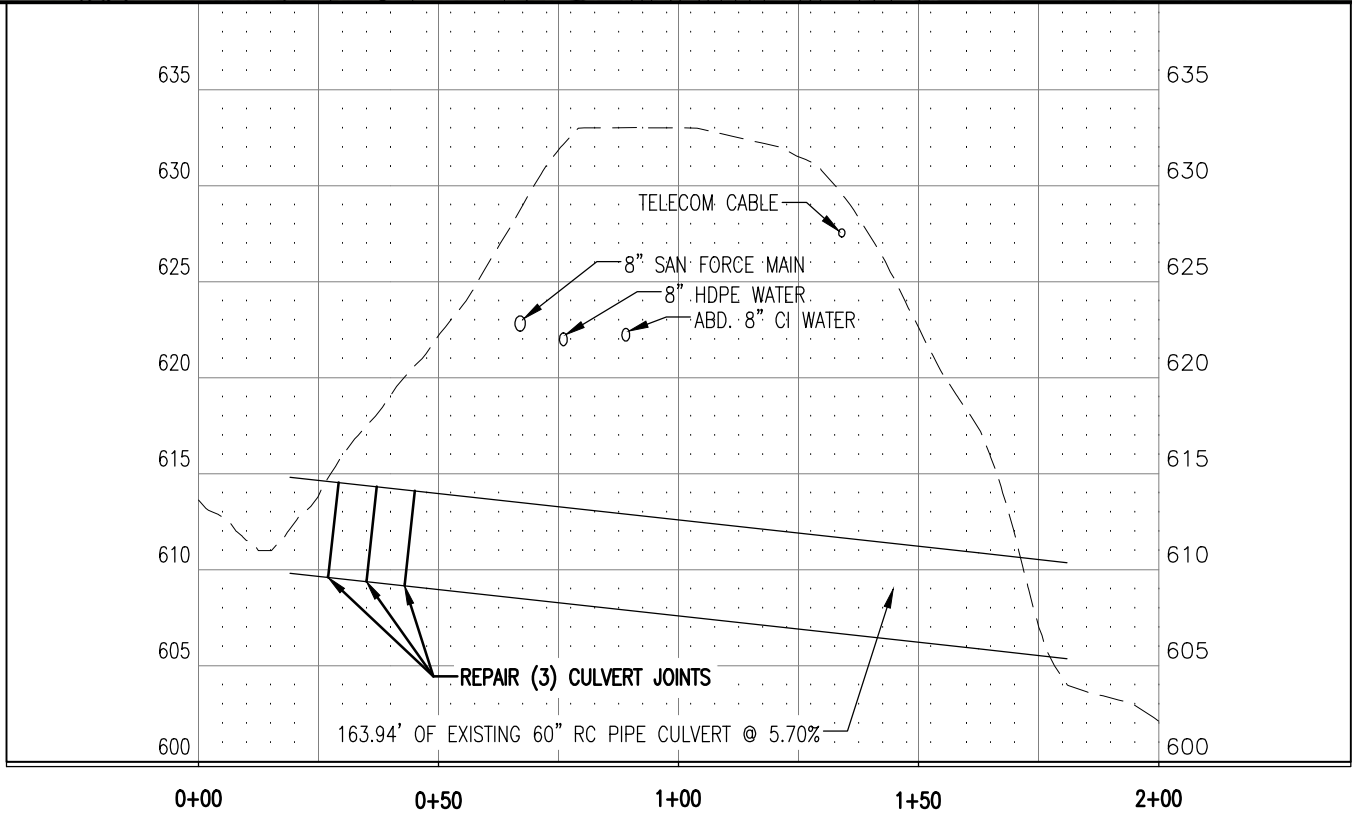




CULVERT 36 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2501.603	REPAIR CULVERT JOINT	LF	45



- LEGEND**
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 36

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: 3/8/2016  
LIC. NO: 22442



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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

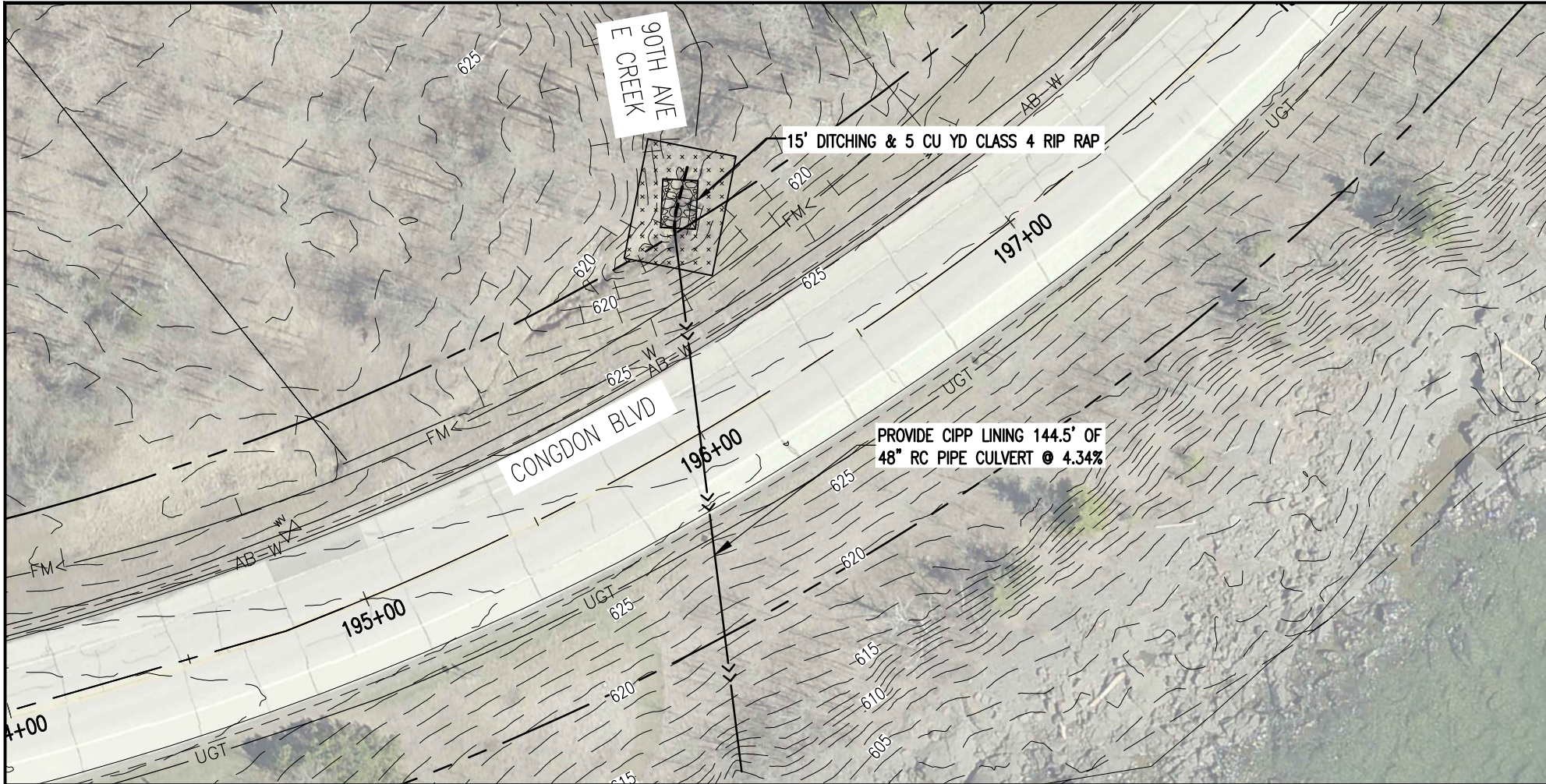
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DRAWN BY: JJM

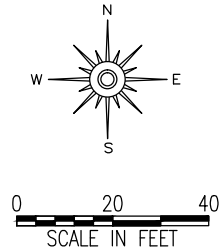
CULVERT 36 PLAN & PROFILE

SHEET NO. 29 OF 40

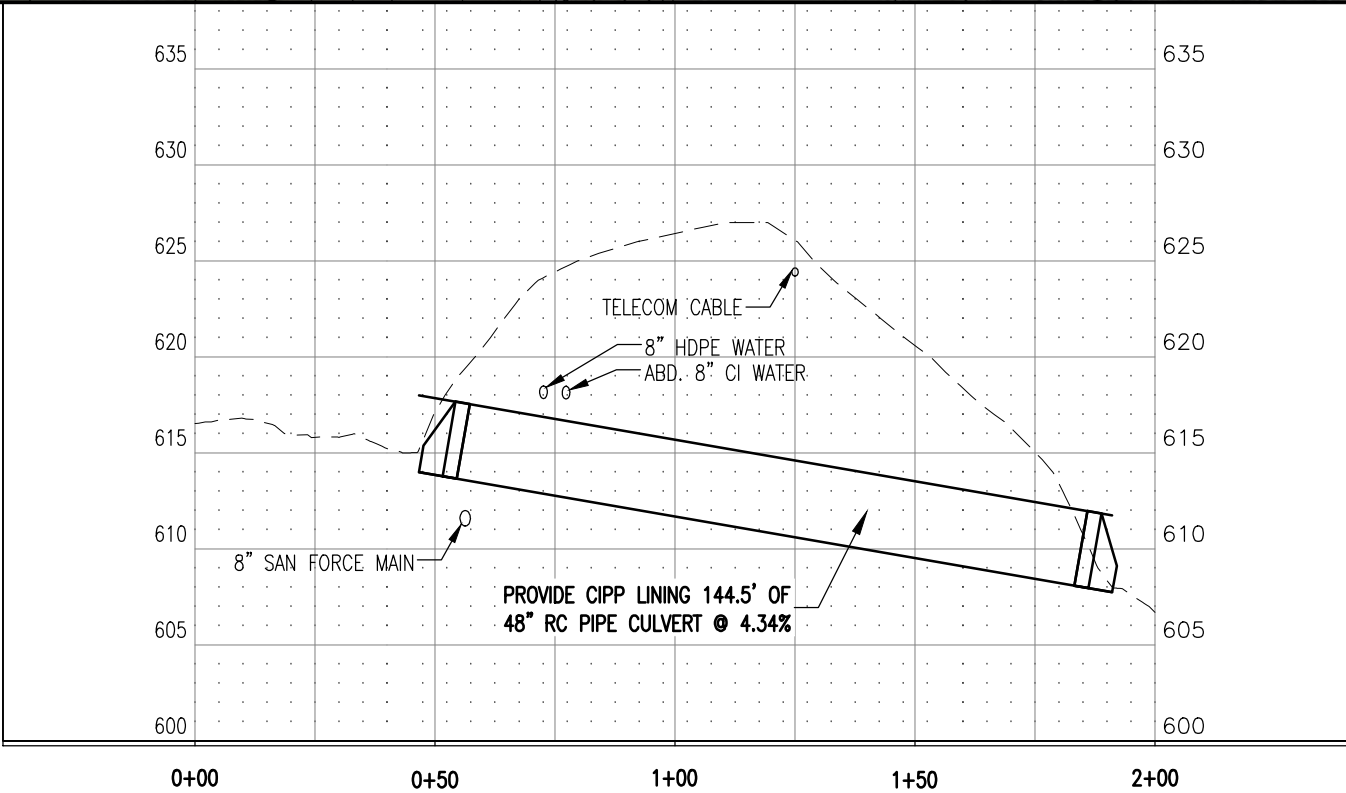




CULVERT 37 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	15
2503.603	48" CIPP LINER STORM CULVERT	LF	145
2511.501	RANDOM RIPRAP CLASS IV	CY	5
2574.508	FERTILIZER TYPE 3	POUND	3
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.02
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	73



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 37

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CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

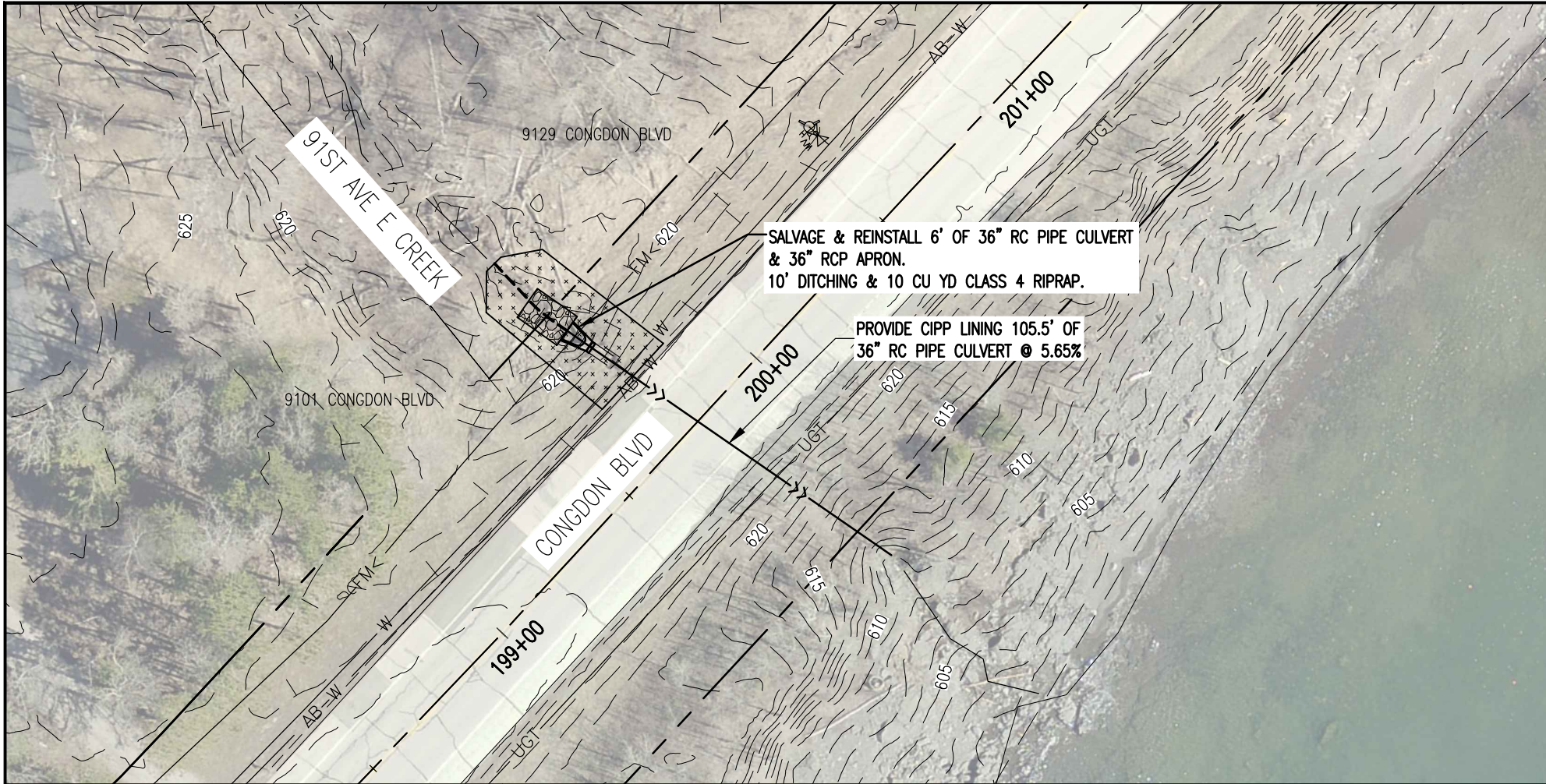
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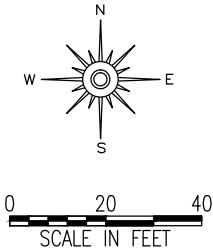
CULVERT 37 PLAN & PROFILE

SHEET NO. 30 OF 40

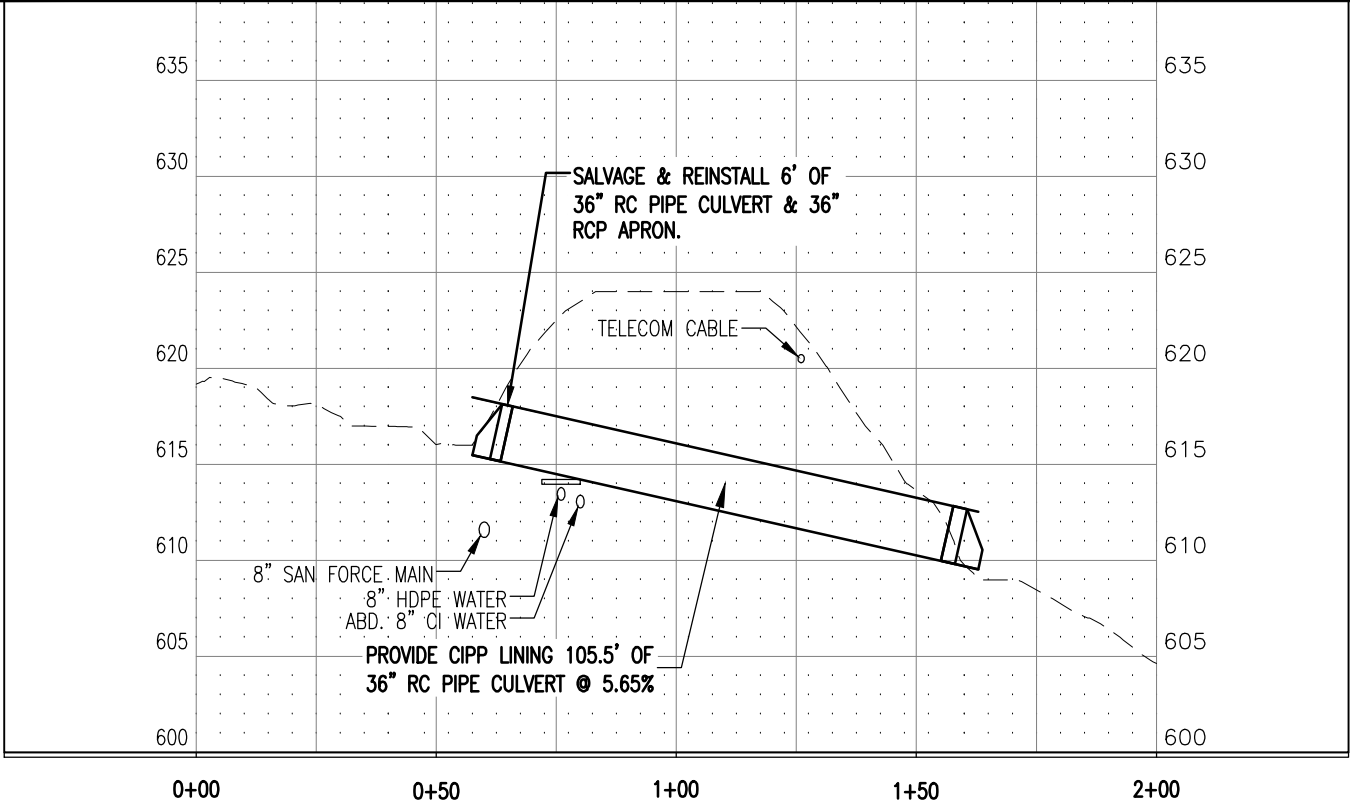




CULVERT 38 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.521	SALVAGE PIPE CULVERT	LF	6
2104.523	SALVAGE PIPE APRON	EACH	1
2105.603	DITCHING	LF	10
2501.571	INSTALL PIPE CULVERT (36" RCP)	LF	6
2501.573	INSTALL PIPE APRON	EACH	1
2503.603	36" CIPP LINER STORM CULVERT	LF	106
2511.501	RANDOM RIPRAP CLASS IV	CY	10
2574.508	FERTILIZER TYPE 3	POUND	5
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.02
2575.502	SEED MIXTURE 25-141	POUND	2
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	102



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 38

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CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

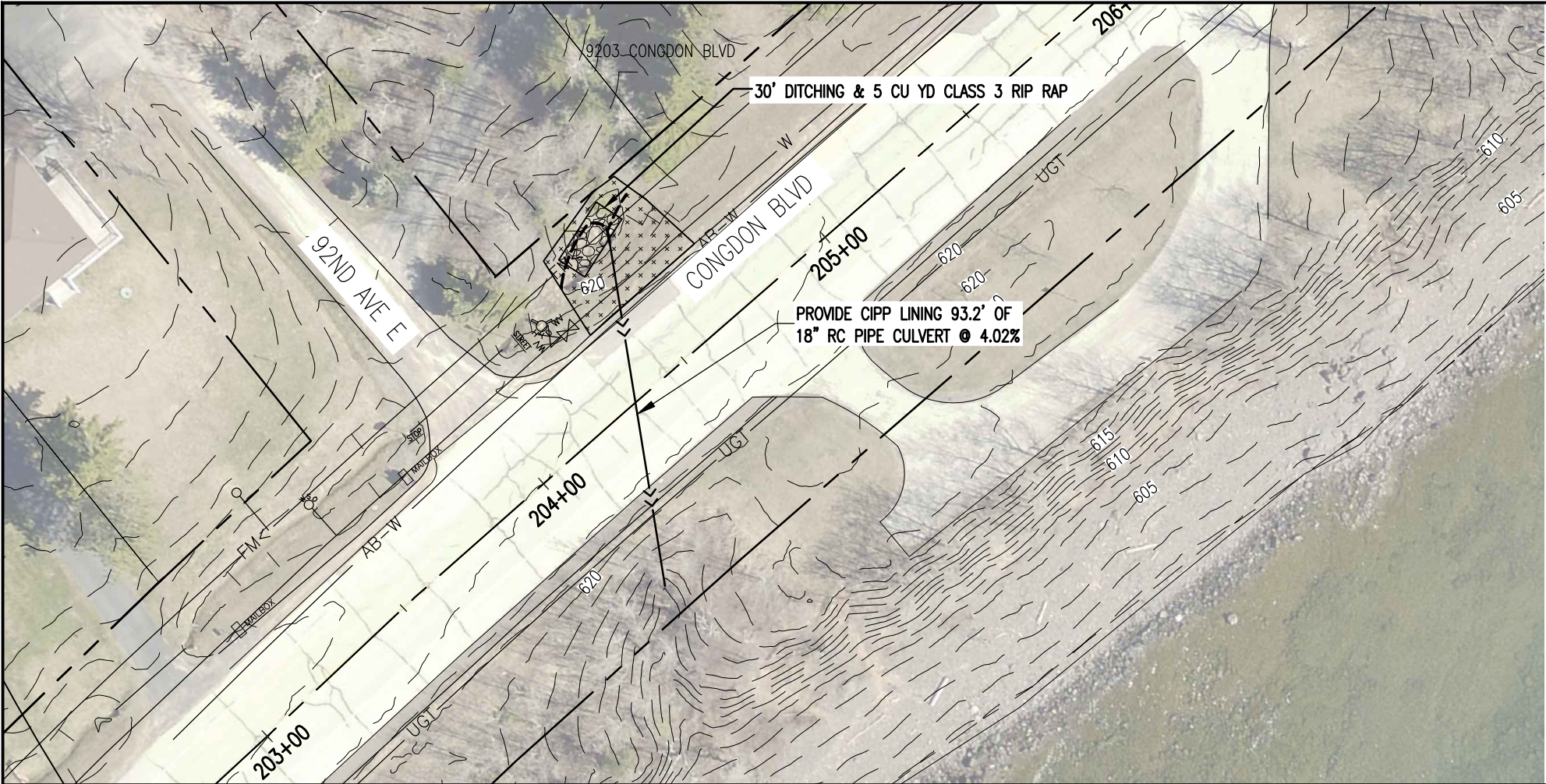
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DRAWN BY: JJM

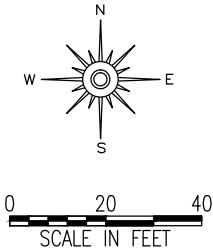
CULVERT 38 PLAN & PROFILE

SHEET NO. 31 OF 40

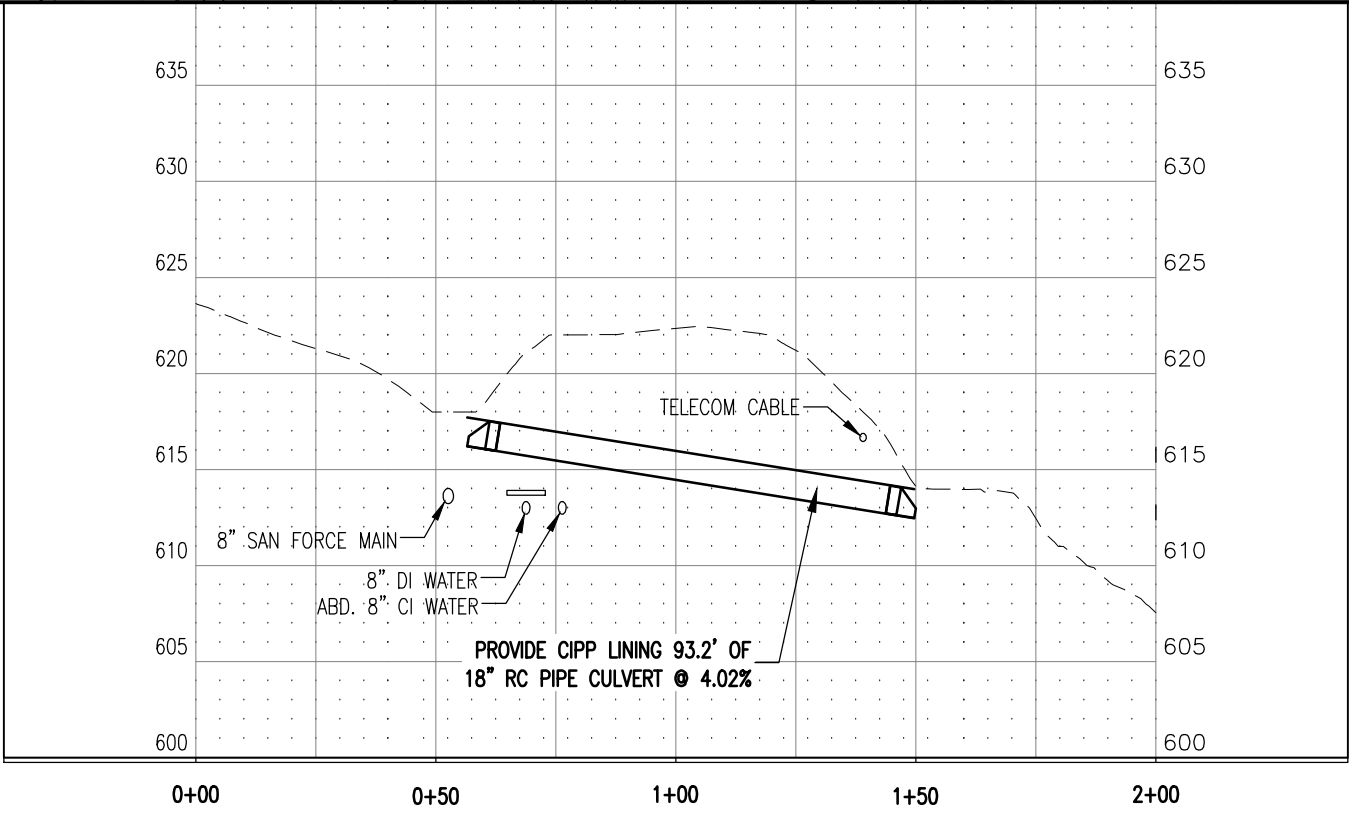




CULVERT 39 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	30
2503.603	18" CIPP LINER STORM CULVERT	LF	93
2511.501	RANDOM RIPRAP CLASS III	CY	5
2574.508	FERTILIZER TYPE 3	POUND	4
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.02
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	80



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 39

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ENGINEERING DIVISION  
411 W. 1ST ST. STE. 211  
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CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

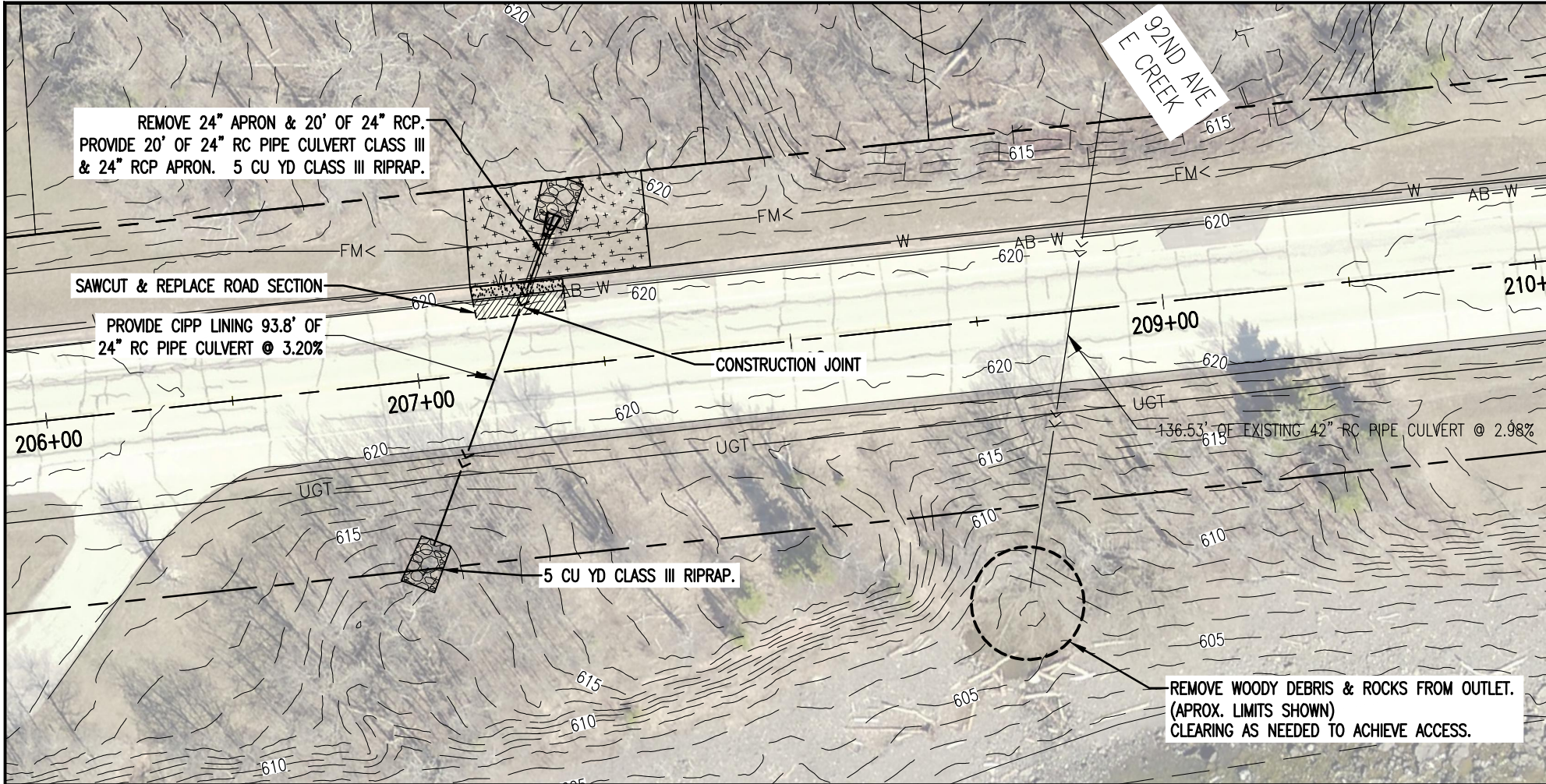
STATE AID PROJECT NO.: NA

DRAWN BY: JJM

CULVERT 39 PLAN & PROFILE

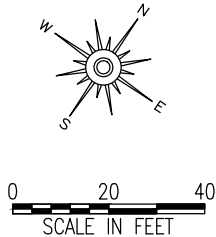
SHEET NO. 32 OF 40



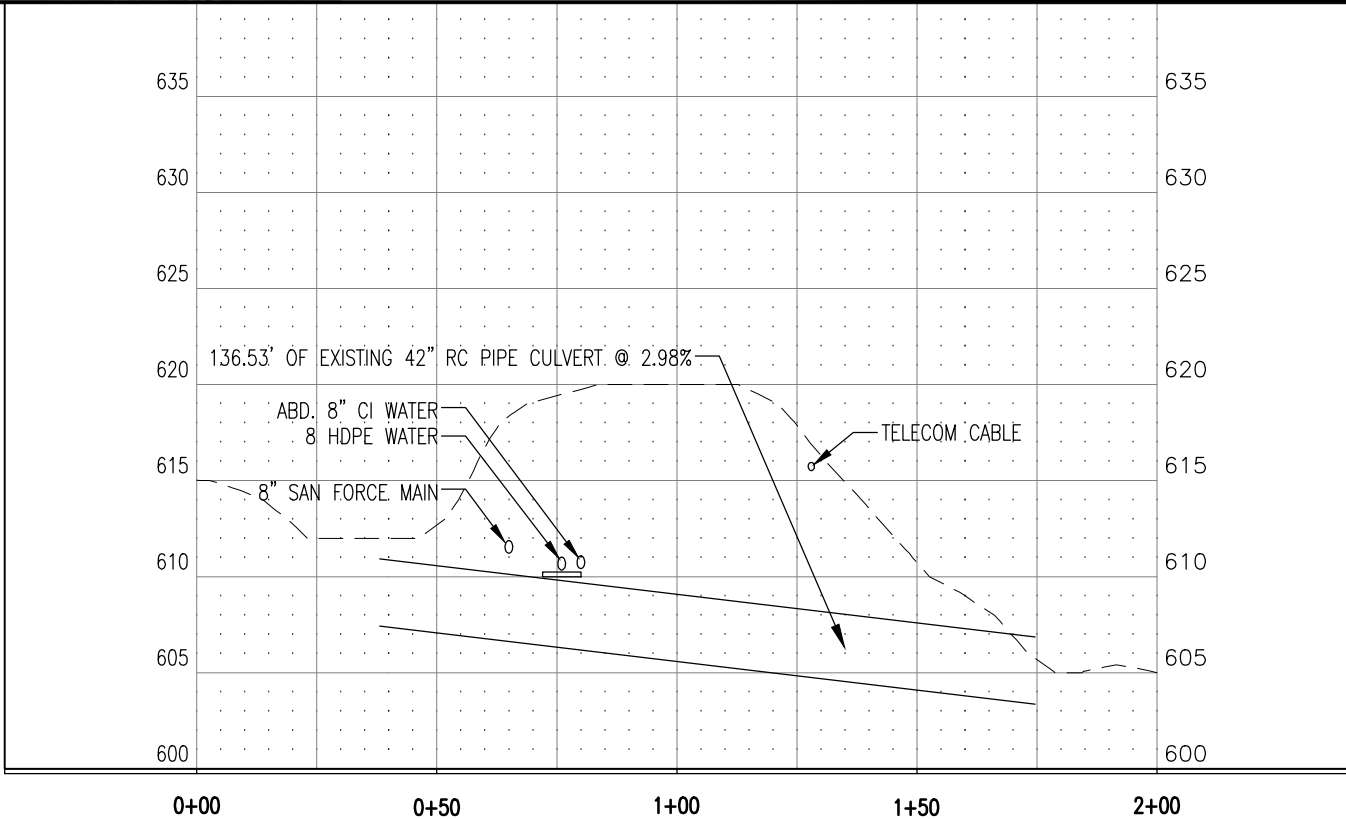
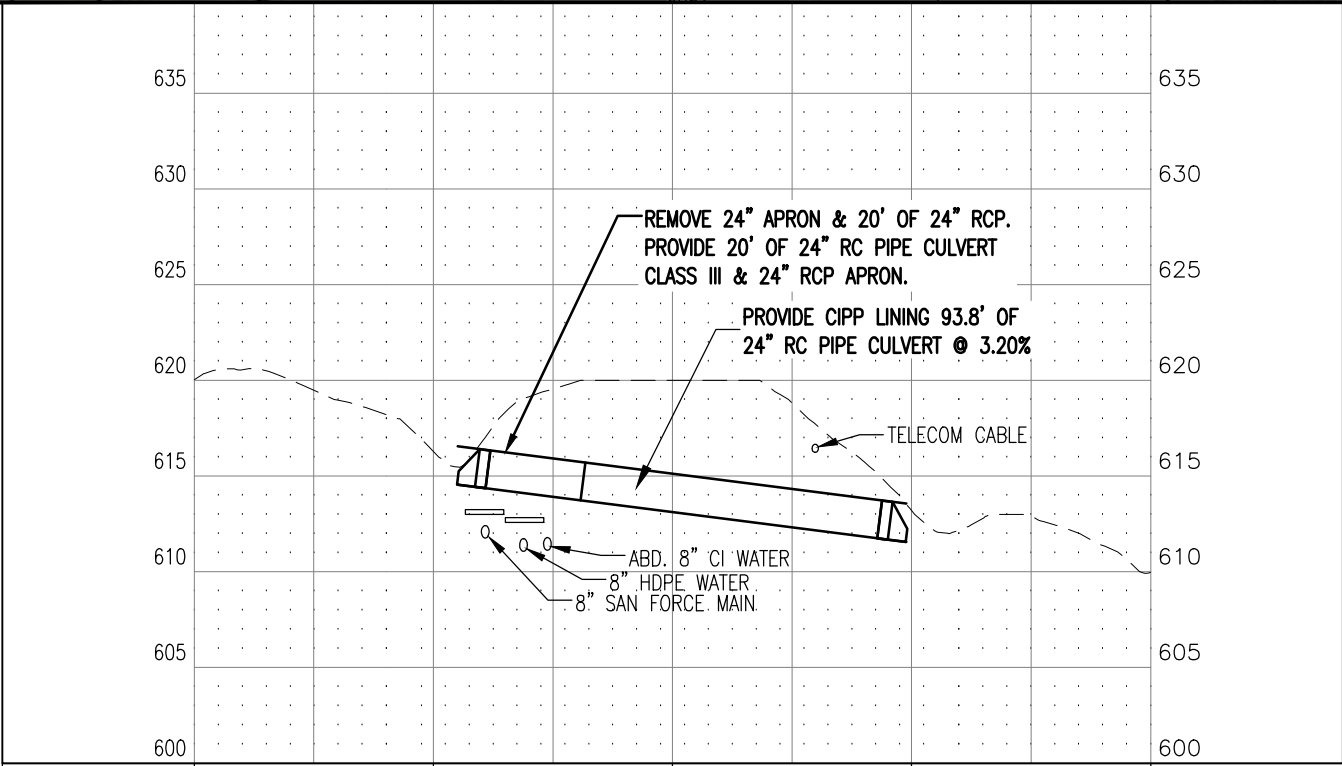


CULVERT 40 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.501	REMOVE CONCRETE CULVERT	LF	20
2104.505	REMOVE BITUMINOUS PAVEMENT	SY	15
2104.509	REMOVE CONCRETE APRON	EACH	1
2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LF	36
2211.503	AGGREGATE BASE (CV) CLASS 5	CY	10
2360.501	TYPE SP 9.5 WEARING COURSE MIX (3,B)	TON	3
2501.511	24" RCP PIPE CULVERT CLASS III	LF	20
2501.515	24" RCP PIPE APRON	EACH	1
2503.603	24" CIPP LINER STORM CULVERT	LF	94
2511.501	RANDOM RIPRAP CLASS III	CY	10
2574.508	FERTILIZER TYPE 3	POUND	6
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.03
2575.502	SEED MIXTURE 25-141	POUND	2
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	125

CULVERT 41 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.601	REMOVE MISCELLANEOUS DEBRIS	LS	0.9



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 40

CULVERT 41

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: 3/8/2016  
LIC. NO: 22442



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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

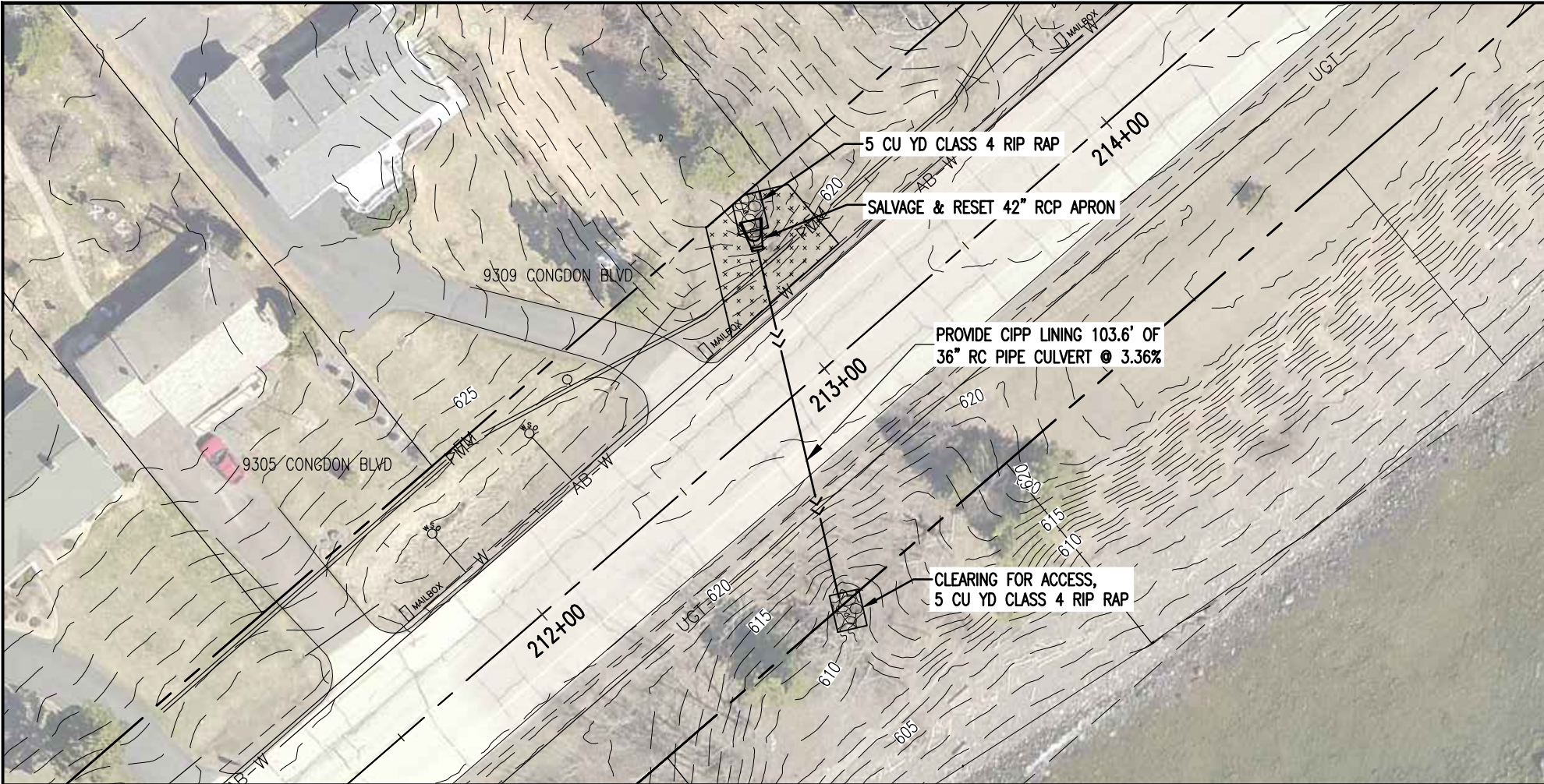
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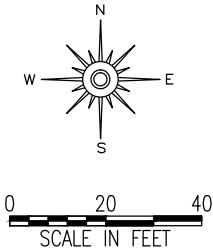
CULVERT 40 & 41 PLAN & PROFILE

SHEET NO. 33 OF 40

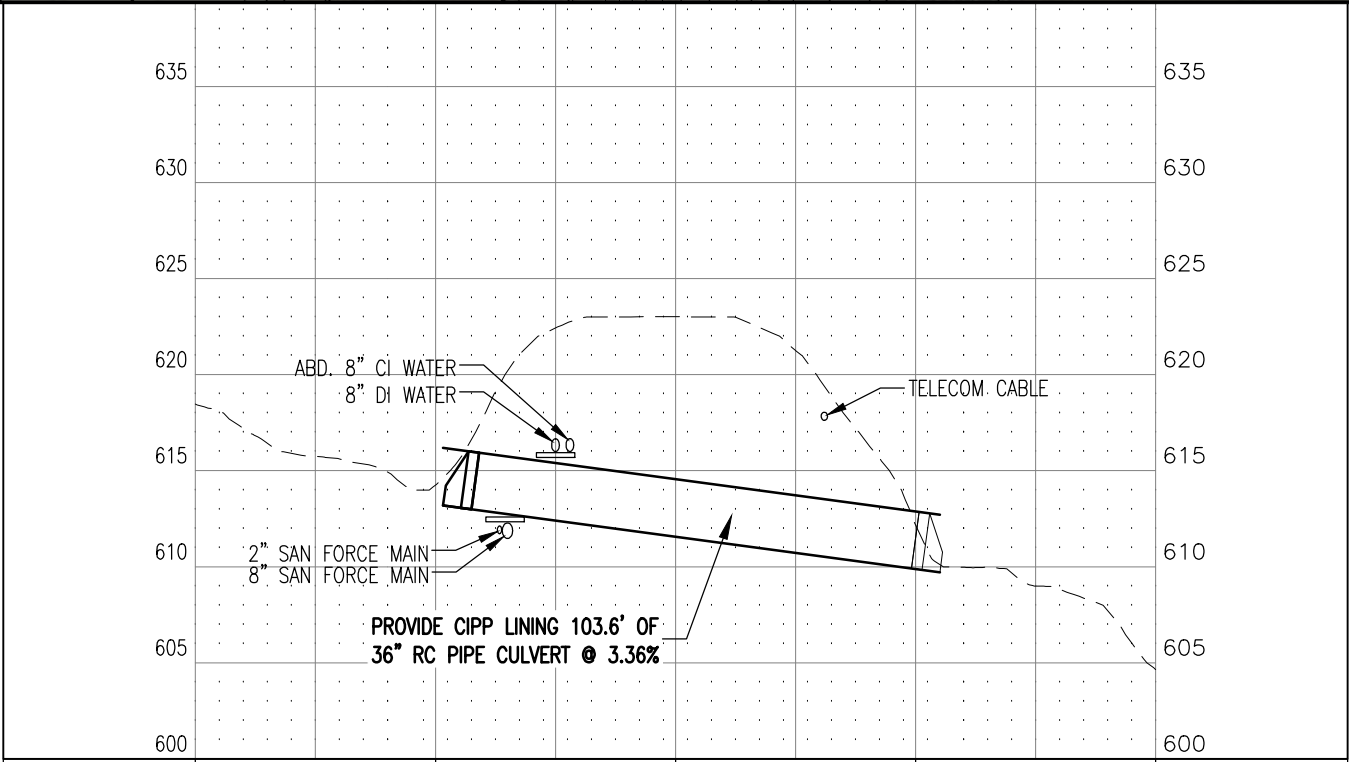




CULVERT 42 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.523	SALVAGE PIPE APRON	EACH	1
2501.573	INSTALL PIPE APRON	EACH	1
2503.603	36" CIPP LINER STORM CULVERT	LF	104
2511.501	RANDOM RIPRAP CLASS IV	CY	10
2574.508	FERTILIZER TYPE 3	POUND	4
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.02
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	80



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 42

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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

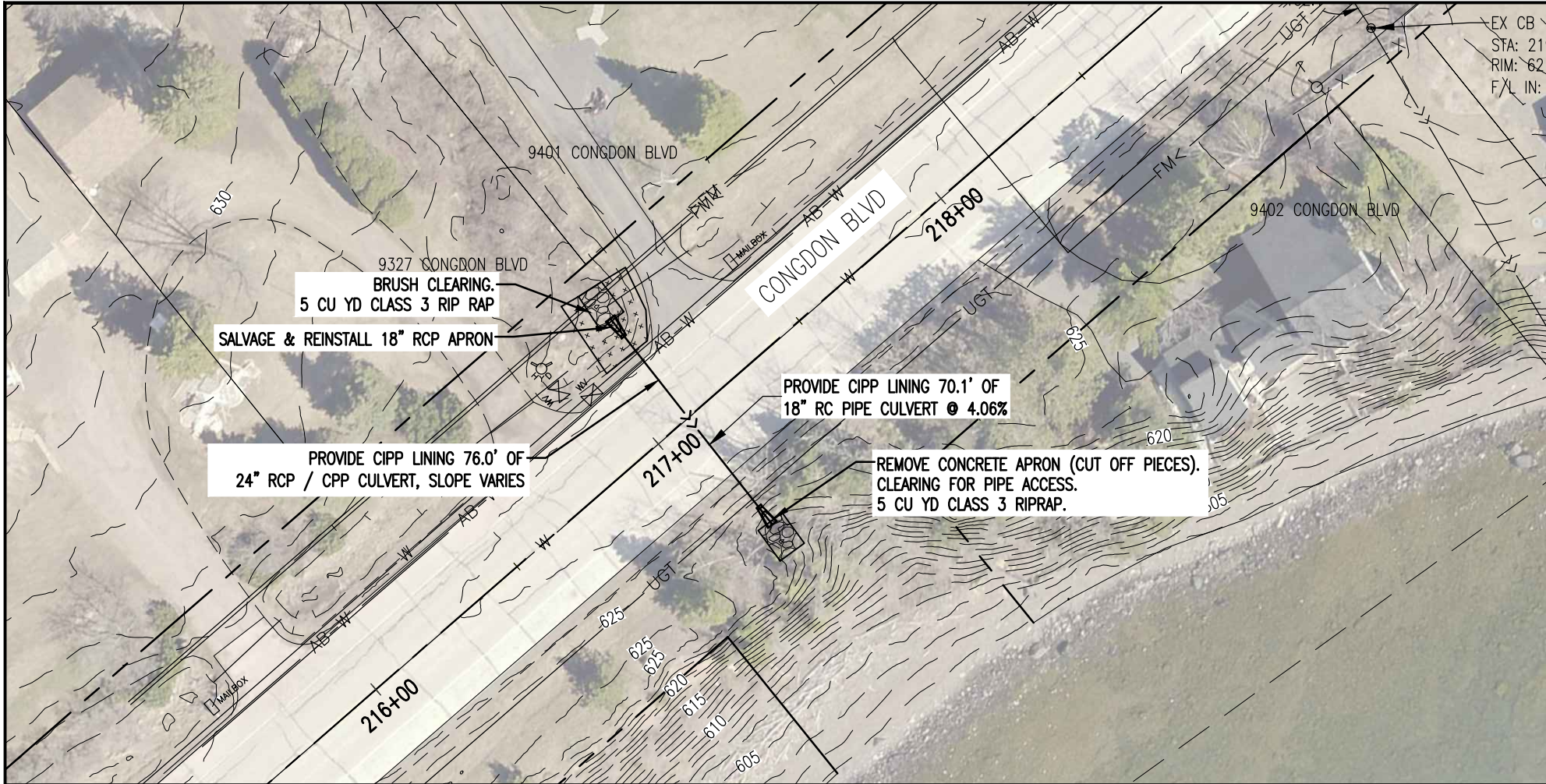
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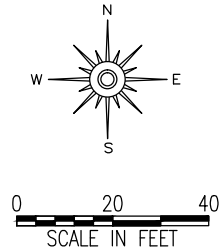
CULVERT 42 PLAN & PROFILE

SHEET NO. 34 OF 40

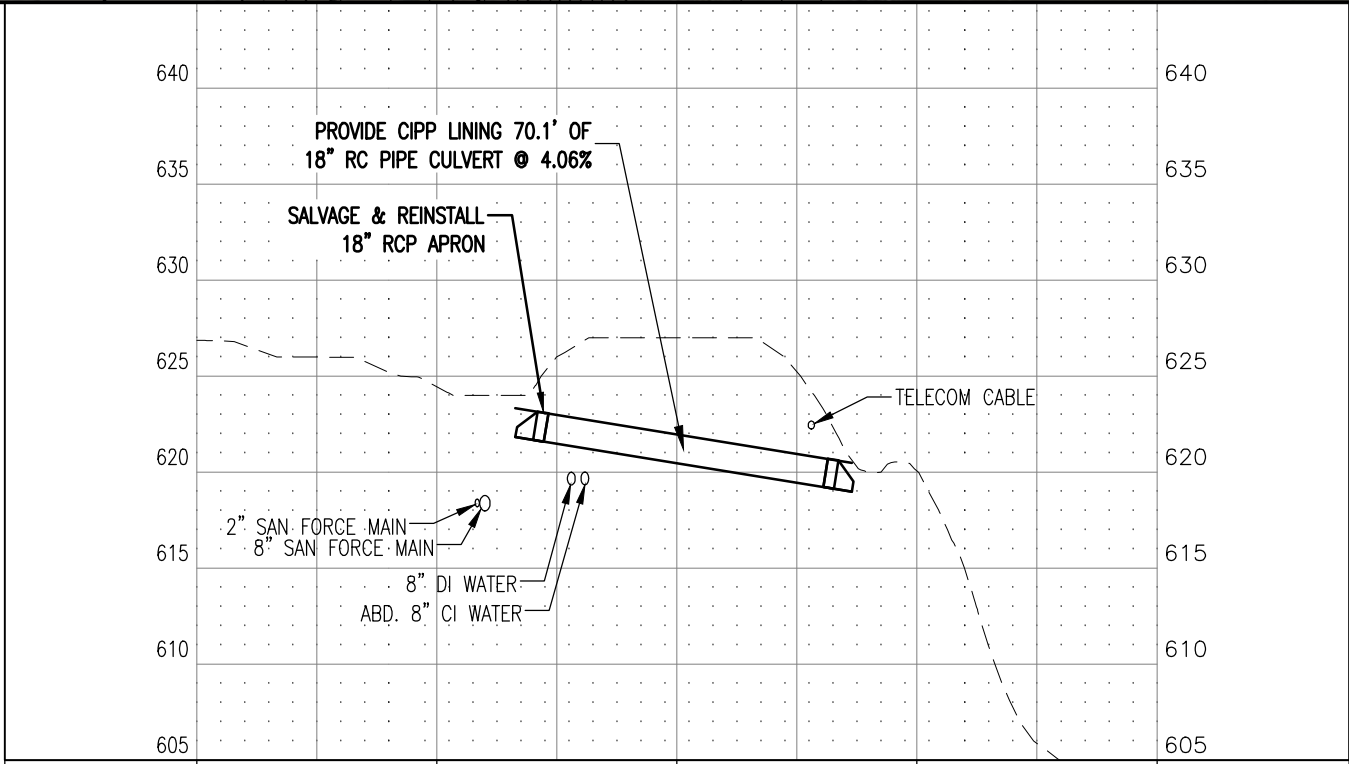




CULVERT 43 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.509	REMOVE CONCRETE APRON	EACH	1
2104.523	SALVAGE PIPE APRON	EACH	1
2501.573	INSTALL PIPE APRON	EACH	1
2503.603	18" CIPP LINER STORM CULVERT	LF	70
2511.501	RANDOM RIPRAP CLASS III	CY	10
2574.508	FERTILIZER TYPE 3	POUND	2
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	32



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 43

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THOMAS M. PFEFFER  
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ENGINEERING DIVISION  
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CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

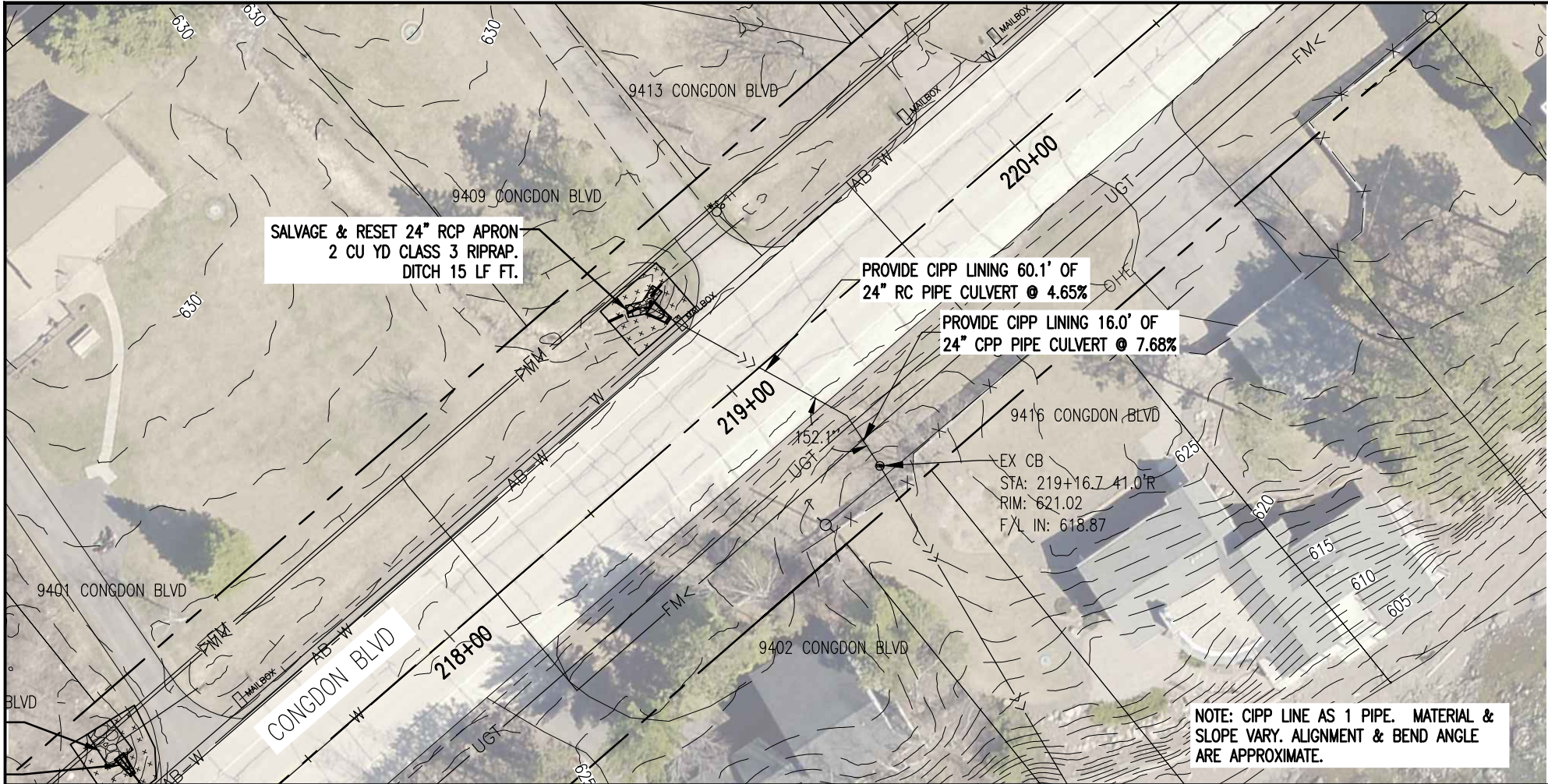
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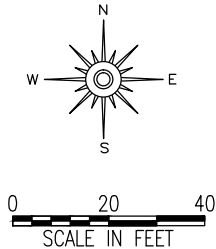
CULVERT 43 PLAN & PROFILE

SHEET NO. 35 OF 40



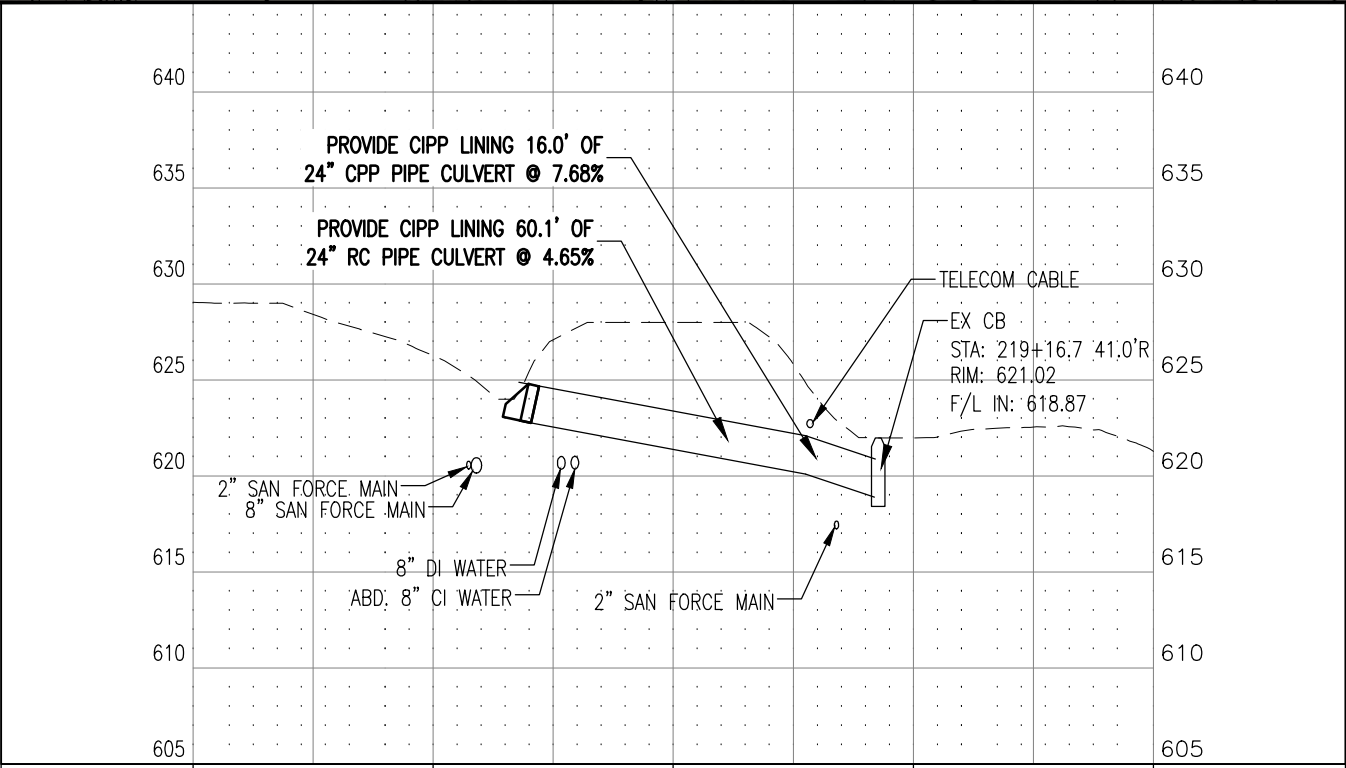


CULVERT 44 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.523	SALVAGE PIPE APRON	EACH	1
2105.603	DITCHING	LF	15
2501.573	INSTALL PIPE APRON	EACH	1
2503.603	24" CIPP LINER STORM CULVERT	LF	76
2511.501	RANDOM RIPRAP CLASS III	CY	2
2574.508	FERTILIZER TYPE 3	POUND	2
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	31



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - ===== FILTER LOG TYPE STRAW
  - [Pattern] RANDOM RIPRAP, CLASS III
  - [Pattern] TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - [Pattern] CLASS 5 SHOULDERING
  - [Pattern] REPLACE EXISTING ROAD SECTION

NOTE: CIPP LINE AS 1 PIPE. MATERIAL & SLOPE VARY. ALIGNMENT & BEND ANGLE ARE APPROXIMATE.



CULVERT 44

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THOMAS M. PFEFFER  
TYPE NAME

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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

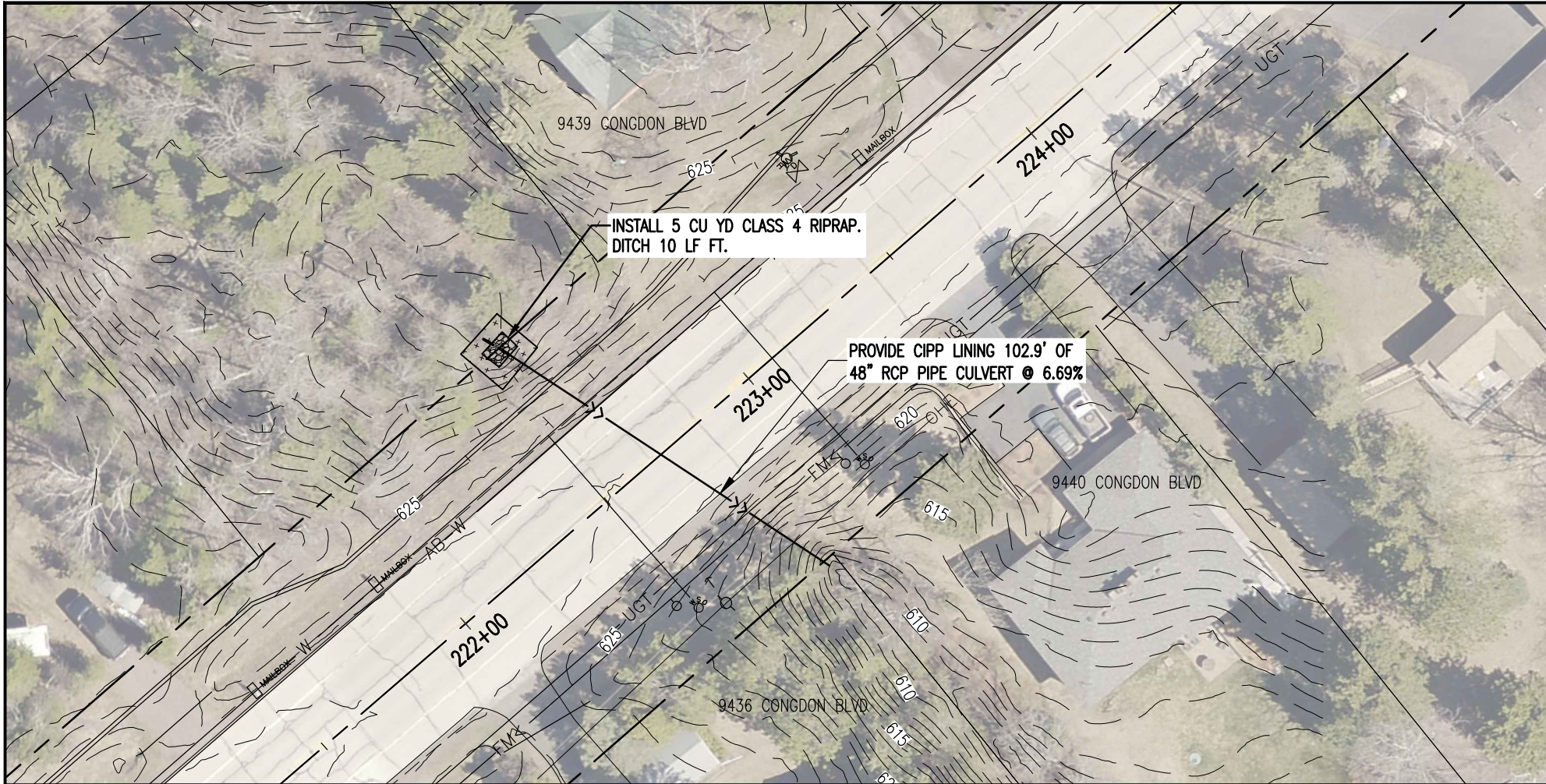
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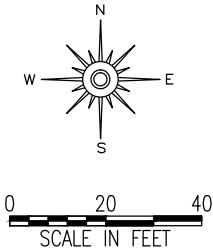
CULVERT 44 PLAN & PROFILE

SHEET NO. 36 OF 40

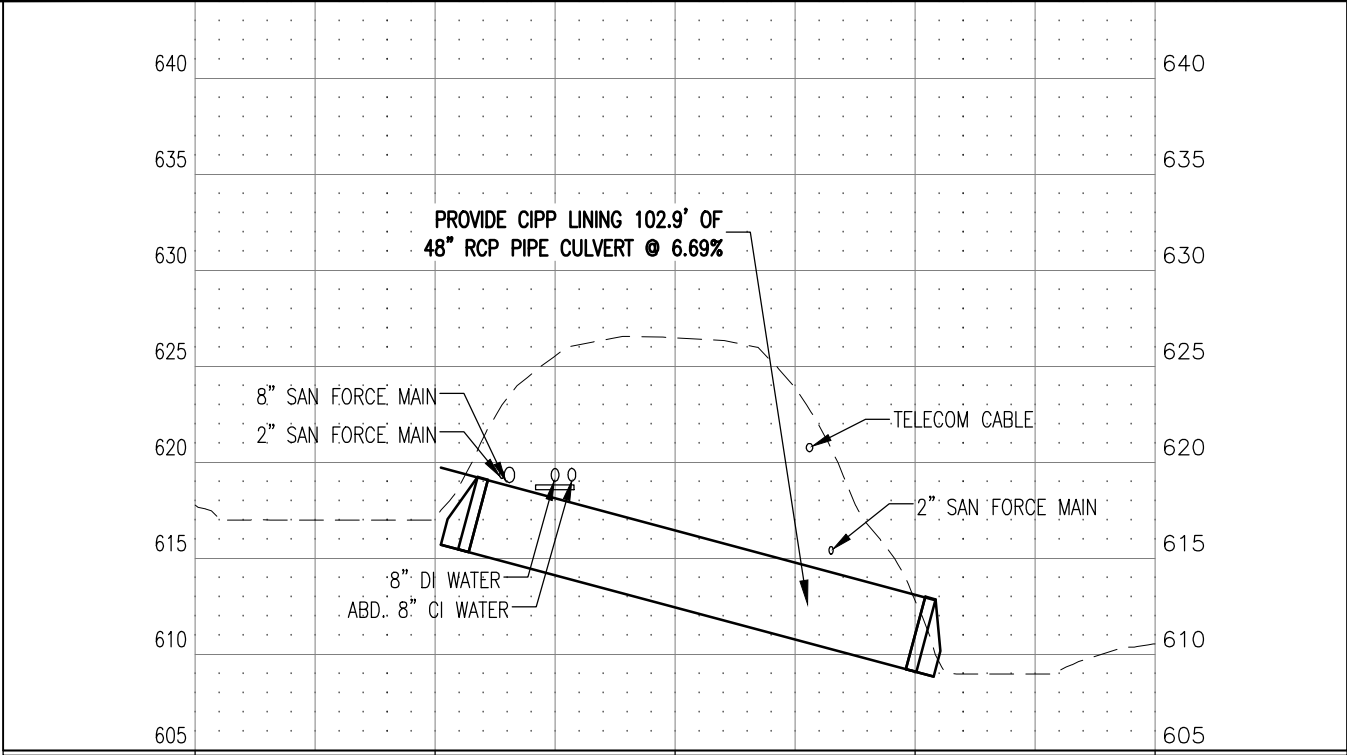




CULVERT 45 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2105.603	DITCHING	LF	10
2503.603	48" CIPP LINER STORM CULVERT	LF	103
2511.501	RANDOM RIPRAP CLASS IV	CY	5
2574.508	FERTILIZER TYPE 3	POUND	1
2574.525	COMMON TOPSOIL BORROW (LV)	CY	1
2575.501	SEEDING	ACRE	0.01
2575.502	SEED MIXTURE 25-141	POUND	1
2575.523	EROSION CONTROL BLANKETS CATEGORY 3P	SY	18



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 45

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SIGNATURE: Thomas M. Pfeffer

THOMAS M. PFEFFER  
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CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

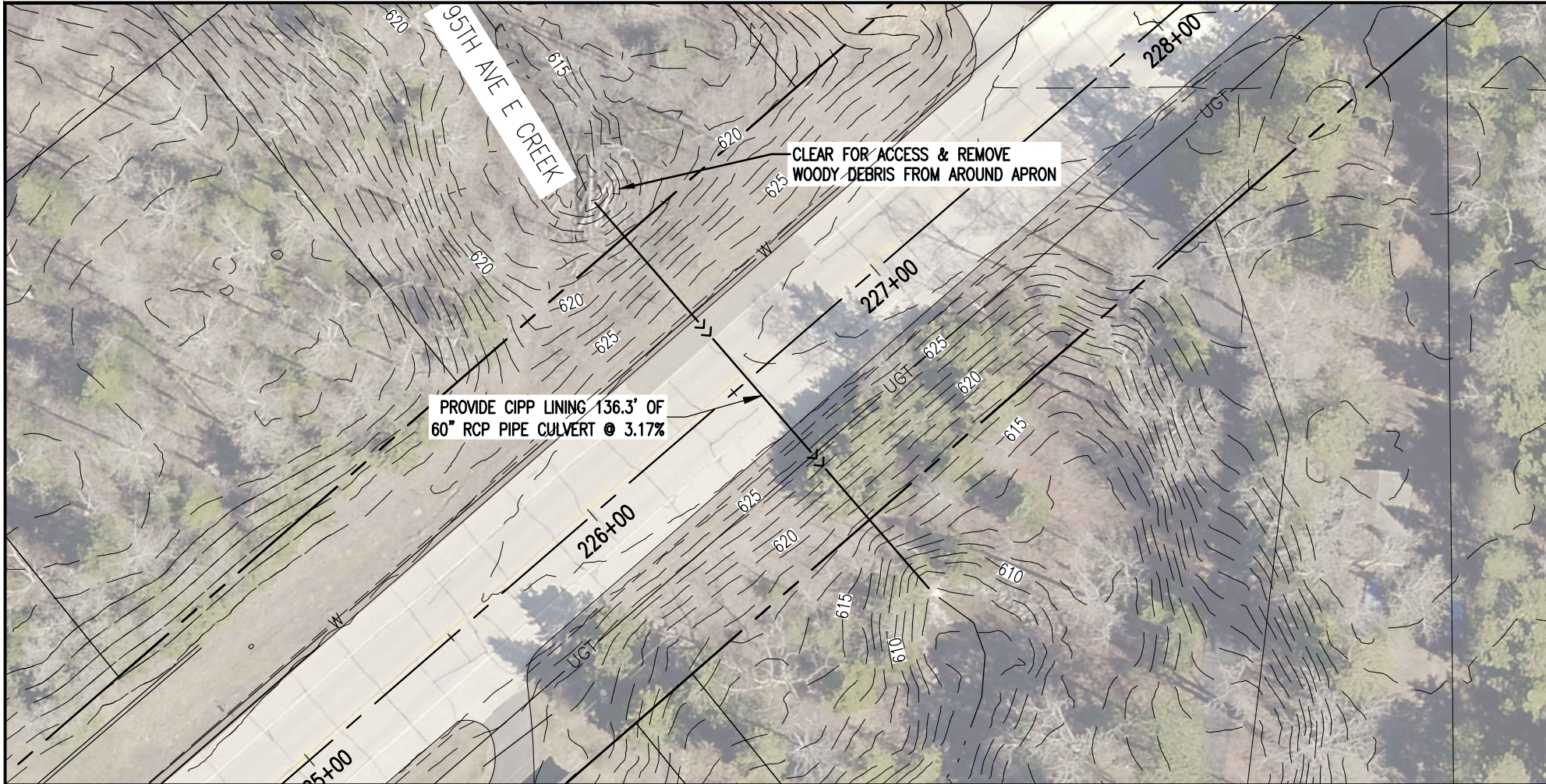
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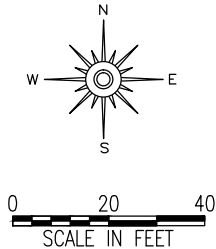
CULVERT 45 PLAN & PROFILE

SHEET NO. 37 OF 40

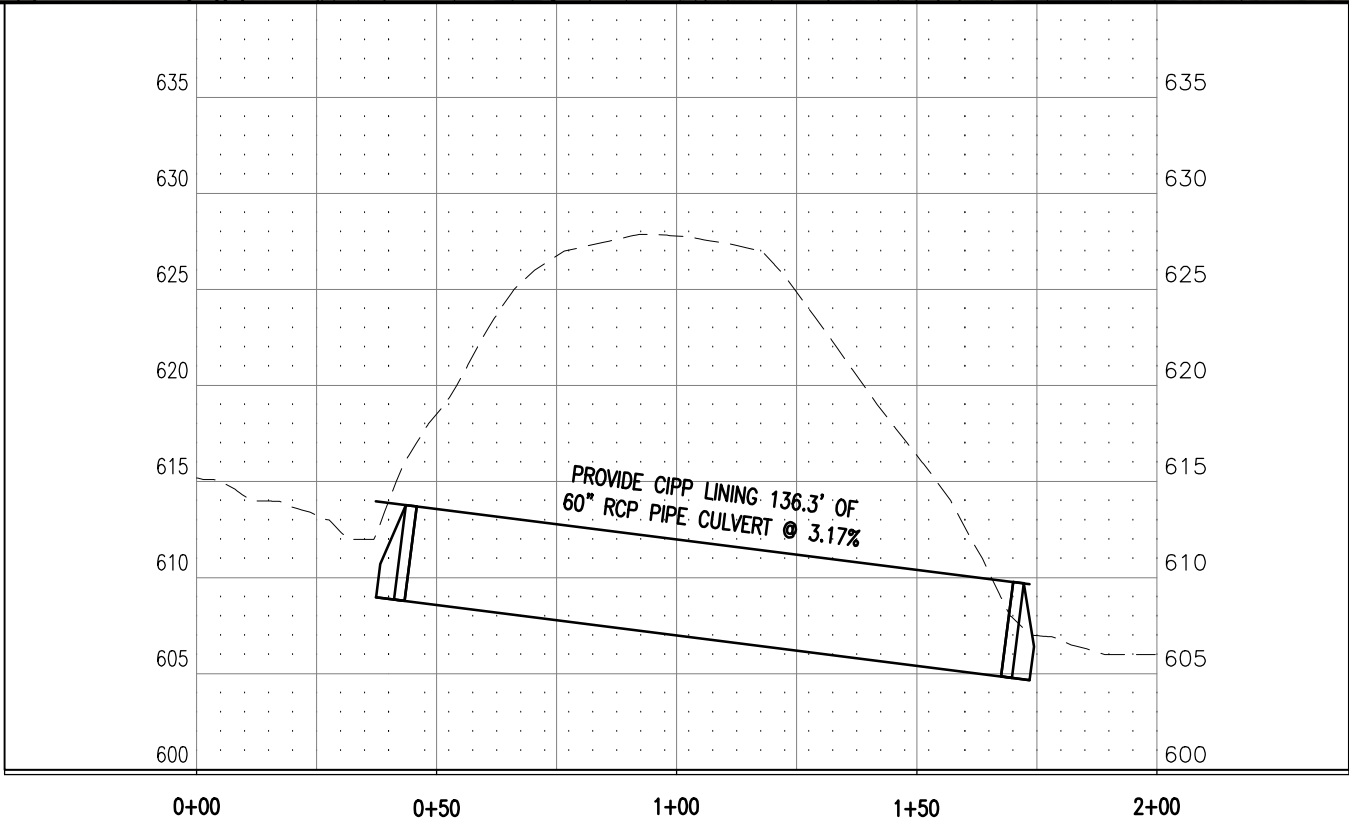




CULVERT 46 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2104.601	REMOVE MISCELLANEOUS DEBRIS	LS	0.1
2503.603	60" CIPP LINER STORM CULVERT	LF	136



- LEGEND**
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - [Pattern] RANDOM RIPRAP, CLASS III
  - [Pattern] TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - [Pattern] CLASS 5 SHOULDERING
  - [Pattern] REPLACE EXISTING ROAD SECTION



CULVERT 46

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: 3/8/2016  
LIC. NO.: 22442



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411 W. 1ST ST. STE. 211  
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CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

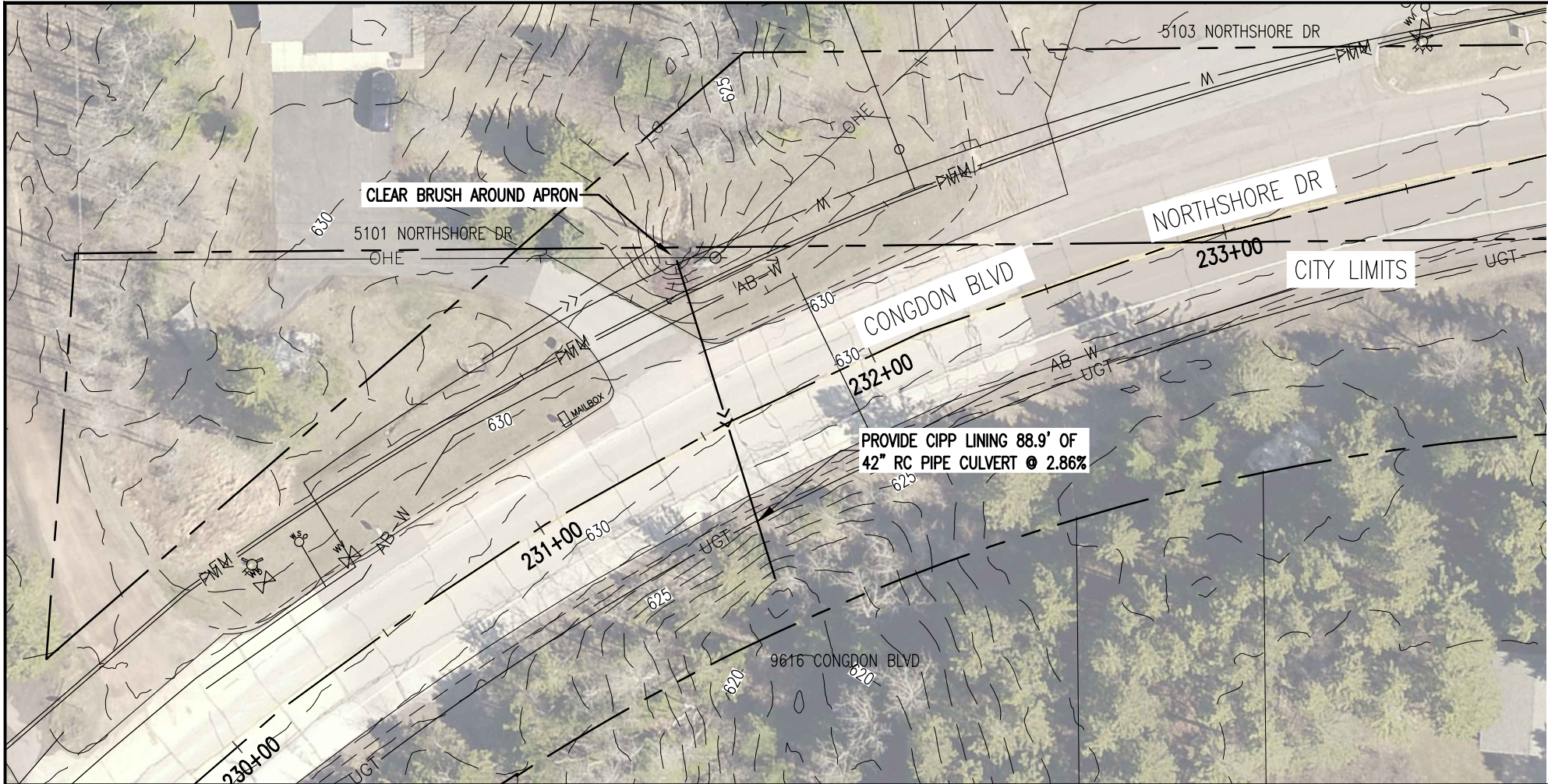
STATE AID PROJECT NO.: NA

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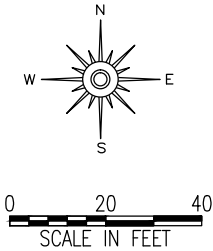
CULVERT 46 PLAN & PROFILE

SHEET NO. 38 OF 40

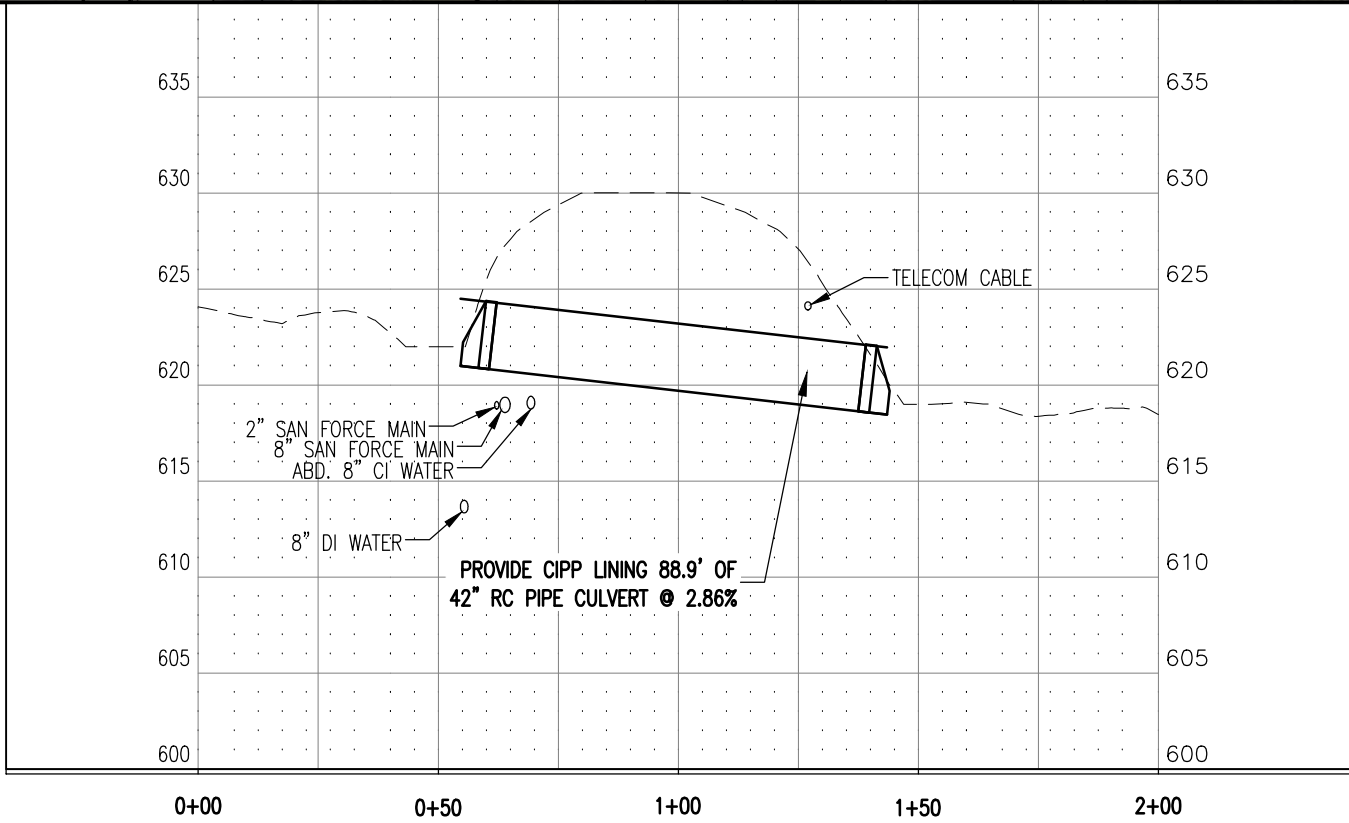




CULVERT 47 ESTIMATED QUANTITIES			
SPEC. NO.	DESCRIPTION	UNIT	QUANTITY
2503.603	42" CIPP LINER STORM CULVERT	LF	89



- LEGEND
- DITCH GRADING
  - SAWCUT (FULL DEPTH)
  - FILTER LOG TYPE STRAW
  - RANDOM RIPRAP, CLASS III
  - TOPSOIL, FERTILIZER, SEED, EROSION CONTROL BLANKET
  - CLASS 5 SHOULDERING
  - REPLACE EXISTING ROAD SECTION



CULVERT 47

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SIGNATURE: *Thomas M. Pfeiffer*

THOMAS M. PFEFFER  
TYPE NAME

DATE: 3/8/2016  
LIC. NO.: 22442



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

CONGDON BLVD CULVERT LINING AND REPLACEMENT (2016)

CITY PROJECT NO.: 1387

STATE AID PROJECT NO.: NA

DRAWN BY: JJM

CULVERT 47 PLAN & PROFILE

SHEET NO. 39 OF 40



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STORM WATER POLLUTION PREVENTION PLAN (SWPPP) - GENERAL PROJECT INFORMATION:

1. this project consists of providing cured-in-place-pipe lining of thirty-three culvert pipes, two culvert pipe replacements, and numerous culvert pipe spot repairs along Congdon Boulevard between Highway 61 and McQuade Road.
2. THE TOTAL DISTURBED AREA OF THE PROJECT IS 0.44 ACRES.
3. THE EXISTING TERRAIN INCLUDES A MIX OF GRASS LAWNS AND WOODED RURAL AREAS. STEEP SLOPES EXTEND FROM THE ROAD CORRIDOR DIRECTLY TO LAKE SUPERIOR.
4. THE EXISTING SOIL TYPES INCLUDE CLAY, SILT, AND GRANULAR MATERIAL/FILL IN ROAD EMBANKMENT.
5. CONSTRUCTION DATES ARE ESTIMATED TO BE FROM MAY 2016 TO OCTOBER 2016.
6. THE RECEIVING WATER FOR STORM WATER FROM THE PROJECT INCLUDES EXISTING CULVERTS AND STORM SEWER SYSTEMS LEADING TO LAKE SUPERIOR. NO TMDL IMPLEMENTATION PLANS CURRENTLY EXIST FOR LAKE SUPERIOR.
7. CITY OF DULUTH MAINTENANCE IS RESPONSIBLE FOR LONG TERM OPERATION AND MAINTENANCE OF THE STORM WATER SYSTEM.
8. OWNER AND RECORDS RETENTION: CITY OF DULUTH, PWU-ENGINEERING, ROOM 211 CITY HALL, 411 WEST FIRST STREET, DULUTH, MN 55802. (218) 730-5200.
9. PROJECT ENGINEER: TOM PFEFFER, CITY OF DULUTH, PWU-ENGINEERING, ROOM 211 CITY HALL, 411 WEST FIRST STREET, DULUTH, MN 55802. (218) 730-5104. [tpfeffer@duluthmn.gov](mailto:tpfeffer@duluthmn.gov)

IMPERVIOUS SURFACE CALCULATIONS:

1. THERE IS NO NET CHANGE TO THE IMPERVIOUS SURFACE AREA AS A RESULT OF THIS PROJECT.

OWNER AND CONTRACTOR RESPONSIBILITIES:

1. THE CONTRACTOR SHALL OBTAIN AN EROSION AND SEDIMENTATION CONTROL PERMIT (ESC) FROM THE CITY OF DULUTH FOR ALL PROJECTS WITH MORE THAN 3,000 SQUARE FEET OF GROUND DISTURBING ACTIVITIES.
2. THE OWNER AND CONTRACTOR SHALL OBTAIN (AS CO-PERMITTEES) AN NPDES-SDS FOR CONSTRUCTION ACTIVITIES PERMIT FROM THE MPCA FOR ALL PROJECTS WITH ONE (1) ACRE OR MORE OF GROUND DISTURBING ACTIVITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF THE SWPPP AND THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPs) BEFORE AND DURING CONSTRUCTION.
4. THE CONTRACTOR SHALL KEEP WRITTEN INSPECTION AND MAINTENANCE LOGS (INCLUDING ALL CORRECTIVE ACTIONS) IN ACCORDANCE WITH THIS SWPPP AND PROJECT PERMITS. A COPY OF SWPPP INSPECTION RECORDS SHALL BE PROVIDED TO THE OWNER UPON COMPLETION OF THE WORK.
5. THE CONTRACTOR SHALL COORDINATE ALL WORK ACTIVITIES TO MINIMIZE EXPOSURE TO EROSION. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL AND SEDIMENT CONTAINMENT DEVICES TO MINIMIZE THE RUNOFF, TRACKING, AND SEDIMENT LOSS FROM DISTURBED AREAS.
6. THE OWNER AND CONTRACTOR WILL REVIEW THE EFFECTIVENESS OF THE SWPPP. THE CONTRACTOR SHALL DOCUMENT AND IMPLEMENT ALL NECESSARY SWPPP REVISIONS. THE CONTRACTOR SHALL PROVIDE QUALIFIED STAFF TO IMPLEMENT THE SWPPP.

TIMING OF BEST MANAGEMENT PRACTICES (BMP) INSTALLATION:

1. THE EROSION AND SEDIMENTATION CONTROL BMPs SHALL BE INSTALLED AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND CAPTURE SEDIMENT ON SITE. TEMPORARY PERIMETER CONTROL BMPs SHALL BE INSTALLED BEFORE ANY UP GRADIENT SOIL DISTURBANCE OCCURS.
2. THE CONTRACTOR SHALL PROVIDE RAPID STABILIZATION METHOD 4 (MN/DOT 2575) WITHIN 2 HOURS OF NOTICE.
3. PERMANENT AND TEMPORARY SEDIMENT TRAPS AND BASINS (IF APPLICABLE) WILL BE CONSTRUCTED BEFORE ANY CONVEYANCE OR DEWATERING OCCURS.
4. WHEN CONSTRUCTION ACTIVITY CEASES FOR 3 DAYS OR MORE IN AN AREA, THAT AREA SHALL BE STABILIZED WITH TEMPORARY OR PERMANENT BMP's. THIS ALSO APPLIES TO AGGREGATE STOCKPILES ON THE PROJECT.
5. PLACEMENT OF RIPRAP SHALL BE COMPLETED WITHIN 24 HOURS OF CULVERT PLACEMENTS AND DONE IN ONE CONTINUOUS OPERATION. ALL SLOPES AND DITCHES SHALL BE STABILIZED PRIOR TO OPENING NEW CULVERTS INTO EXISTING DRAINAGE WAYS.

EROSION PREVENTION AND SEDIMENT CONTROL:

1. THE CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO PREVENT SOIL TRACKING ONTO ROADWAYS. SOIL, MUD, OR DEBRIS, TRACKED, OR DEPOSITED ONTO PAVED SURFACES SHALL BE REMOVED AT THE END OF EACH WORK DAY.
2. THE CONTRACTOR SHALL BE PROACTIVE IN THEIR APPROACH TO MINIMIZING SOIL EROSION AND SEDIMENT TRANSPORT. THE CONTRACTOR SHALL INSTALL BMPs PRIOR TO ANY RAIN EVENT, INCLUDING RAIN EVENTS DURING NON-WORK TIMES (I.E. NIGHTS AND WEEKENDS).
3. tHE CONTRACTOR SHALL UTILIZE CONCRETE WASH OUT CONTAINMENT DEVICES INTENDED FOR THAT PURPOSE. DISCHARGE OF SURPLUS CONCRETE OR drum WASH WATER ON the PROJECT IS PROHIBITED.
4. WATER DISCHARGED FOR CONSTRUCTION DEWATERING SHALL BE DIRECTED THROUGH EFFECTIVE FILTERING DEVICES IN ACCORDANCE WITH MN/DOT 3875.
5. BMP's SHALL BE IN CONFORMANCE WITH THE PLAN DETAILS AND LOCAL INDUSTRY STANDARDS, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

CONSTRUCTION PRACTICES TO PREVENT STORM WATER CONTAMINATION:

1. ALL SOLID WASTE MATERIALS SHALL BE COLLECTED EACH DAY AND STORED IN APPROVED CONTAINMENT. THE CONTRACTOR SHALL DISPOSE OF ALL SOLID WASTE MATERIALS TO A LICENSED WASTE CONTRACTOR. NO CONSTRUCTION MATERIALS SHALL BE BURIED ON-SITE.
2. ALL CONSTRUCTION VEHICLES SHALL BE MONITORED FOR LEAKS AND SHALL RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE POTENTIAL FOR LEAKAGE.
3. PETROLEUM PRODUCTS, PAINT, CURING COMPOUNDS, AND FERTILIZERS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS. EXCESS PRODUCTS SHALL NOT BE DISCHARGED TO THE STORM WATER SYSTEM.
4. FORM RELEASE OIL USED FOR CONCRETE WORK MUST BE APPLIED OVER AN ABSORBENT BLANKET OR PAD TO COLLECT OVER SPRAY LIQUID.
5. SPILL KITS SHALL BE PROVIDED WITH ALL FUELING SOURCES AND MAINTENANCE ACTIVITIES. ALL SPILLS SHALL BE CONTAINED AND CLEANED-UP IMMEDIATELY UPON DISCOVERY. SPILLS LARGE ENOUGH TO REACH THE STORM WATER CONVEYANCE SYSTEM SHALL BE REPORTED TO THE MINNESOTA DUTY OFFICER.

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN		
DESCRIPTION	SHEET TITLE	SHEET NO
SUMMARY OF IMPERVIOUS AREAS	SWPPP	40
DIRECTION OF FLOW / DRAINAGE AREAS	PLAN	9-39
RECEIVING SURFACE WATERS	SWPPP	9-39
DISTURBANCE AREAS AND CONSTRUCTION LIMITS	SWPPP	40
DRAINAGE STRUCTURES	PLAN & PROFILE	9-39
DRAINAGE AND EROSION CONTROL TABULATIONS	PLAN	9-39
SEDIMENT CONTROL PRACTICES	SWPPP	40
PERMANENT STABILIZATION	PLAN	9-39
PERMANENT TREATMENT CALCULATIONS	SWPPP	40

SWPPP - REGULATORY AGENCY CONTACTS				
AGENCY	PERMIT	NAME	PHONE	EMAIL
MPCA	NPDES	JAMES DEXTER	(218) 302-6632	<a href="mailto:James.dexter@pcs.state.mn.us">James.dexter@pcs.state.mn.us</a>
SWCD	WCA	RC BOHEIM	(218) 723-4629	<a href="mailto:RC.Boheim@southstlouisswcd.org">RC.Boheim@southstlouisswcd.org</a>
MN/DNR	WATERS	PATRICIA FOWLER	(218) 834-6621	<a href="mailto:Patricia.fowler@dnr.state.mn.us">Patricia.fowler@dnr.state.mn.us</a>
US/ACOE	SECTION 404	DARYL WIERZBINSKI	(218) 834-6630	<a href="mailto:Daryl.w.wierzbinski@mvp02.usa.ce.army.mil">Daryl.w.wierzbinski@mvp02.usa.ce.army.mil</a>
STATE DUTY OFFICIER	NA	MPCA	(800) 422-0798	
CITY OF DULUTH	MS4 COMPLIANCE	TOM JOHNSON	(218) 730-5103	<a href="mailto:tajohnson@duluthmn.gov">tajohnson@duluthmn.gov</a>
LGU – CITY OF DULUTH	NA	KYLE DEMING	(218) 730-5329	<a href="mailto:kdeming@duluthmn.gov">kdeming@duluthmn.gov</a>
CITY OF DULUTH	SOLID WASTE COMPLIANCE	KAREN O'DONNELL	(218) 730-5148	<a href="mailto:kodennell@duluthmn.gov">kodennell@duluthmn.gov</a>

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: 3/8/2016

LIC. NO: 22442



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