

CITY OF DULUTH

DEPARTMENT OF PUBLIC WORKS AND UTILITIES

ENGINEERING DIVISION

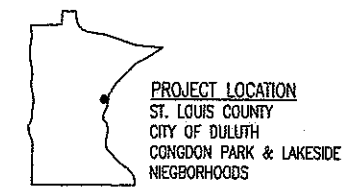
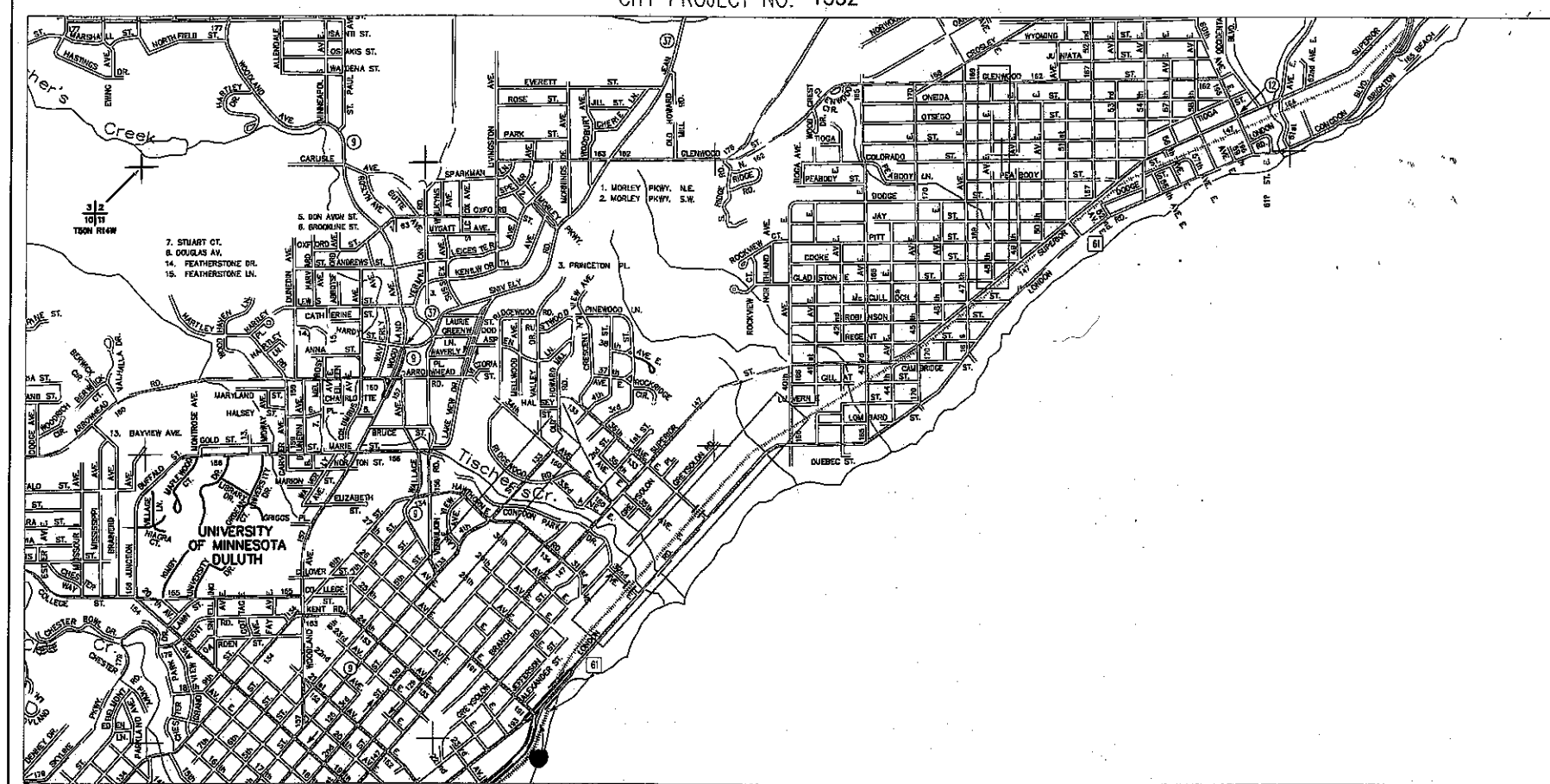
CITY BID # 2017-0266

CONSTRUCTION PLANS FOR:

2017 LARGE DIAMETER GAS MAIN INSTALLATION PROJECTS

- PIPE BURSTING 6" MDPE GAS MAIN ON 48TH AVE E.
- 3100 FEET OF 8" MDPE GAS MAIN ON 4TH ST.
- 2850 FEET OF 12" HDPE GAS MAIN ON LONDON RD.

CITY PROJECT NO. 1532



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

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THIS PLAN CONTAINS 55 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.

HOWARD D. SMITH, P.E.
PROJECT ENGINEER (TYPED OR PRINTED NAME)

PROJECT ENGINEER DATE 46875 LIC. NO.

CITY APPROVAL

APPROVED CHIEF ENGINEER OF TRANSPORTATION DATE 3/13/17

APPROVED CHIEF ENGINEER OF UTILITIES DATE 3/13/17

APPROVED CITY ENGINEER DATE 3/13/17

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 811 OR 1-800-252-1166 REQUIRED BY LAW

I:\PWU\ENGINEER\PROJECTS\1500-1999\1532-48th Ave. E. Gas Main\23-ACAD-DRAWINGS\1532_SEQ.dwg

STATEMENT OF ESTIMATED QUANTITIES					
LINE	NOTES	SPEC NO	ITEM DESCRIPTION	UNIT	QUANTITY
1	1	2021.501	MOBILIZATION	LUMP SUM	3
2	2	2104.501	REMOVE OR ABANDON 4" AND SMALLER GAS MAIN	LN FT	65
3	2	2104.501	REMOVE OR ABANDON 8" AND LARGER GAS MAIN	LN FT	17
4	7	2104.501	REMOVE 6" ADALY-A GAS MAIN	LN FT	955
5	2	2104.501	REMOVE 6" STEEL GAS MAIN	LN FT	858
6	3	2104.503	REMOVE CURB AND GUTTER	LN FT	526
7		2104.503	REMOVE CONCRETE PAVEMENT	SQ YD	125
8	9	2104.503	REMOVE BITUMINOUS PAVEMENT	SQ YD	425
9	4	2104.511	SAWING BITUMINOUS & CONCRETE (FULL DEPTH)	LN FT	2774
10	22	2105.503	TRENCH BOX INSTALLATION AND REMOVAL	EACH	8
11	5	2105.503	BOULDER EXCAVATION (TRENCH)	CU YD	8
12	21	2105.503	ROCK EXCAVATION (TRENCH)	CU YD	60
13		2201.503	CONCRETE BASE PAVEMENT	CU YD	15
14		2211.503	AGGREGATE BASE (CV) CLASS 5	CU YD	170
15		2301.504	CONCRETE PAVEMENT 8.0" (3Y43)	SQ YD	125
16		2301.602	DRILL & GROUT RIENFORCING BAR (EPOXY COATED) 18" NO 6 BAR	EACH	32
17		2301.602	DRILL & GROUT DOWEL BAR (EPOXY COATED) 18" NO 8 BAR	EACH	195
18		2301.602	NO. 4 REINFORCED TIE BAR (EPOXY COATED)	EACH	150
19	11	2360.501	TYPE SP 9.5 WEARING COURSE MIXTURE (3,C)	TON	30
20	11	2360.501	TYPE SP 12.5 NON WEARING COURSE MIXTURE (3,C)	TON	39
21	13	2451.607	FURNISH GRANULAR BACKFILL (CV)	CU YD	250
22	8	2504.602	GAS TRACER BOX	EACH	6
23	20	2503.602	1" POLY VALVE AND BOX	EACH	1
24	20	2504.602	2" POLY VALVE AND BOX	EACH	18
25	20	2504.602	3" POLY VALVE AND BOX	EACH	2
26	20	2504.602	6" POLY VALVE AND BOX	EACH	1
27	20	2504.602	8" POLY VALVE AND BOX	EACH	1
28		2505.602	EXCAVATION FOR POTHOLING SANITARY OR STORM PIPE	EACH	8
29		2505.602	TELEWISE SEWER CROSSING	EACH	8
30		2505.6026	RECONNECT EXISTING SERVICE	EACH	2
31	23	2505.6026	EXCAVATION FOR ABANDONMENT	EACH	2
32	20	2505.6026	CONNECT EXISTING GAS MAIN TO NEW GAS MAIN	EACH	26
33		2505.603	2" PE GAS MAIN OR SERVICE (OPEN CUT)	LN FT	82
34		2505.603	2" PE GAS MAIN OR SERVICE (DRILLED)	LN FT	297
35		2505.603	3" PE GAS MAIN (OPEN CUT)	LN FT	45
36	10	2505.603	3" PE GAS MAIN (INSERTION)	LN FT	50
37		2503.603	6" PE GAS MAIN (DRILLED)	LN FT	300
38		2505.603	6" PE GAS MAIN (OPEN CUT)	LN FT	585
39	10	2505.603	6" PE GAS MAIN (INSERTION)	LN FT	370
40		2505.603	6" PE GAS MAIN (PIPE BURST)	LN FT	2500
41		2503.603	8" PE GAS MAIN (DRILLED)	LN FT	1563
42		2505.603	8" PE GAS MAIN (OPEN CUT)	LN FT	1530
43		2503.603	12" PE GAS MAIN (DRILLED)	LN FT	2327
44		2505.603	12" PE GAS MAIN (OPEN CUT)	LN FT	952
45	14	2505.604	2" POLYSTYRENE INSULATION	SQ FT	160
46		2531.501	CONCRETE CURB & GUTTER DESIGN B624	LN FT	526
47	6	2531.501	4" CONCRETE SIDEWALK (INCLUDES 4" GRAVEL BASE)	SQ FT	1600
48		2563.601	TRAFFIC CONTROL (48TH AVE EAST PROJECT)	LUMP SUM	1
49		2563.601	TRAFFIC CONTROL (LONDON ROAD PROJECT)	LUMP SUM	1
50		2563.601	TRAFFIC CONTROL (4TH STREET PROJECT)	LUMP SUM	1
51		2531.618	TRUNCATED DOMES	SQ FT	88
52	12	2573.502	SILT FENCE	LN FT	630
53	12,19	2573.533	SEDIMENT CONTROL LOG TYPE STRAW	LN FT	200
54	12	2573.533	SEDIMENT CONTROL LOG TYPE ROCK	EACH	118
55	12,18	2573.533	STORM DRAIN INLET PROTECTION	EACH	60
56	12	2575.533	INLET SAND BAG DIVERSION	EACH	48
57	16	2575.533	ERROSION CONTROL SUPERVISOR	LUMP SUM	1
58	15	2573.602	TEMPORARY STORMWATER DIVERSION	EACH	2
59	17	2575.505	SODDING TYPE LAWN	SQ YD	150
60		2575.605	TURF ESTABLISHMENT	LUMP SUM	1

NOTES	
1	ONE MOBILIZATION QUANTITY WILL BE PAID WHEN EACH INDIVIDUAL PIPELINE (48TH AVE EAST PIPE, 4TH STREET PIPE, AND LONDON ROAD PIPE) PROJECT BEGINS
2	CAPING ABANDONED LINES AND RUNING 1" PE DRAINAGE JUMPERS ARE INCIDENTAL TO THE REMOVAL
3	INCLUDES SAW CUTTING CURB AT LIMITS OF REMOVAL
4	THIS BID ITEMS IS APPLICABLE TO SAWCUTTING SIDEWALK, LAKE WALK, A BITUMINOUS OR CONCRETE STREET REGARDLESS OF SUB BASE MATERIAL OR THICKNESS. CONTRACTOR MUST PROTECT CUT EDGE, DAMAGED CUT EDGES SHALL BE RE-CUT WITHOUT PAYMENT
5	PAYMENT FOR EXCAVATION AND REMOVAL WILL ONLY OCCUR FOR BOULDERS LARGER THAN 1/4 OF A CUBIC YARD
6	NEW SIDEWALK INSTALLATION BID ITEM SHALL INCLUDE REMOVAL AND DISPOSAL OF EXISTING SIDEWALK.
7	REMOVAL OF CASINGS AS DIRECTED ALONG 48TH AVENUE EAST SHALL BE INCIDENTAL TO THIS BID ITEM
8	THIS PAY ITEM IS APPLICABLE FOR ISNTALLATIONS IN STREET PAVEMENT, SIDEWALK, OR TURF AREAS
9	REMOVAL OF CONCRETE STREET BASE UNDER A BITUMINOUS SURFACE SHALL BE INCIDENTAL TO THE BITUMINOUS PAVEMENT REMOVAL.
10	THE INSERTION PRICE PER FOOT SHALL INCLUDE INSPECTION OF THE EXISTING CASING BY TELEVISIONING AND CLEANING OF THE CASING. INSTALLING TRACER WIRE AS DETAILED AND SEALING OF THE CASING ENDS AS PERSCRIBED IN THE PLANS SHALL ALSO BE INCLUSIVE.
11	ASPHALT PAVEMENT QUANTITIES SHALL BE CONVERTED AT 120 LBS/SQ YD/IN OF THICKNESS
12	INCLUDES INSPECTION, MAINTENANCE, AND REPLACEMENT IF NECESSAR OF THESE ITEMS ON A WEEKLY BASIS AND AFTER EACH STORM EVENT INCIDENTAL TO THIS BID ITEM.
13	INCLUDES OFFSITE DISPOSAL OF UNSUITABLE EXCAVATED MATERIALS.
14	TO BE USED AS DIRECTED BY THE ENGINEER TO PROTECT THE GAS MAIN FROM OTHER UTILITIES OR STRUCTURE MINIMUM CLEARANCE ISSUES.
15	IF REQUIRED THIS BID ITEMS SHALL INCLUDE THE COSTS OF FURNISHING AND INSTALLING TEMPORARY PIPING AND SAND BAGS TO DIVERT GUTER FLOWS AROUND OR ABOVE AN OPEN EXCAVATION AS DEPICTED AT HATHORNE ROAD AND 4TH STREET.
16	1/3 OF THE PAYMENT FOR THIS BID ITEM WILL BE RELEASED AT THE END OF EACH PROJECT PHASE WHEN ALL REQUIRED INSPECTIONS OF THE EROSION CONTROL PRACTICES AND WEEKLY REPORTS SUBMITTED TO THE ENGINEER HAVE BEEN COMPLETED
17	TO BE INSTALLED AS DIRECTED BY THE EINGINEER TO PROVIDE IMMEDIATE RESTORATION IN SOCICALY OR EVIRONMENTALLY SENSITIVE AREAS, INCLUDES ROUTING WATERING AS SPECIFIED IN MNDOT 2575.3.K FOR MAINTENANCE OF SOD
18	INCLUDES PAYMENT FOR PROTECTION AS SPECIFIED OF SPECIAL INLET STRUCTURES ALONG LONDON ROAD
19	TO BE INSTALLED AS DIRECTED BY THE ENGINEER, STRAW LOGS AROUND CONTRACTOR PLACED SPOIL PILES ARE INCIDENTAL
20	THIS PAY ITEM DOES NOT INCLUDE EXCAVATION, EXCAVATION SHALL BE INCLUSIVE TO THE NEW PIPE CONSTRUCTION
21	ROCK THAT IS REMOVED BY EXCAVATION WITH A BUCKET WILL NOT BE CONSIDERED ROCK EXCAVATION, BUT MAY QUALITY FOR BOULDER EXCAVATION IF THE SIZE OF ROCKS REMOVED MEET THE MINIMUM PAYMENT SIZE
22	PAYMENT FOR TRENCH BOX INSTALLATION AND REMOVAL SHALL BE MADE BY THE OCCURRENCE WHEN INSTALLATION AT ONE SPECIFIC LOCATION AND UTILIZED BY THE CITY OF DULUTH TO COMPLETE A CONSTRUCTION PROCEDURE. DURATION OF THE TRENCH BOX BEING IN PLACE WILL NOT WARRANT ADDITIONAL PAYMENT. ADDITIONAL PAYMENT WILL NOT BE MADE FOR A SECOND INSTALLATION TO THE CONTRACTOR IF A TRENCH BOX IS INSTALLED AND REMOVED BEFORE WORK IS COMPLETED.
23	THIS PAY ITEM INCLUDES EXCAVATION TO ABANDON A MAIN OR SERVICE WHERE NEW MAIN IS NOT BEING INSTALLED. CAPPING THE LIVE AND ABANDONED PE MAIN IN THIS EXCAVATION IN INCLUSIVE.

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: Howard D. Smith, P.E.

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO: 46875



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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.:

1532

STATE AID PROJECT NO.:

NA

DRAWN BY: J.R.L.

S.E.Q.

SHEET NO. 2 OF 54

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TRAFFIC CONTROL NOTES

1. ALL SIGNING INDICATED ON THIS TRAFFIC CONTROL PLAN, EXCEPT THOSE SIGNS WHICH ARE IN PLACE, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. ALL APPROPRIATE SIGNING SHALL BE MAINTAINED DURING THE LIFE OF THE CONTRACT.
2. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO, AND BE PLACED IN ACCORDANCE WITH, PART VI (INCLUDING THE FIELD MANUAL DATED JANUARY 2014) OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, DATED DECEMBER 2011, AND THE MINNESOTA STANDARD SIGNS MANUAL. THE CONTRACTOR SHALL PROVIDE ALL SIGNING REQUIRED BUT NOT ITEMIZED IN THIS TRAFFIC CONTROL PLAN.
3. MAINTENANCE OF TRAFFIC IS THE RESPONSIBILITY OF THE CONTRACTOR. THROUGH TRAFFIC SHALL BE MAINTAINED DURING ALL PERIODS OF CONSTRUCTION OPERATIONS. BUSINESSES AND GOVERNMENT BUILDINGS SHALL HAVE ACCESS AT ALL TIMES.
4. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY SIGNING, PLASTIC DRUMS AND BARRICADES FOR CHANNELIZATION OF TRAFFIC WITHIN THE CONSTRUCTION ZONE.
5. THE CONTRACTOR SHALL RECEIVE COMPENSATION FOR ALL WORK DESCRIBED HEREIN ON THE BASIS OF A LUMP SUM PAYMENT FOR TRAFFIC CONTROL (2563.601).
6. THE CONTRACTOR SHALL PLACE ADEQUATE PLASTIC DRUMS, WARNING SIGNS AND BARRICADES WITHIN THE CONSTRUCTION ZONE TO PROTECT VEHICULAR TRAFFIC AND PEDESTRIAN TRAFFIC FROM CONSTRUCTION OPERATIONS. ADDITIONAL SIGNING MAY INCLUDE, BUT IS NOT LIMITED TO: BUMP, DIP, LOOSE GRAVEL, ETC. THE NUMBER AND LOCATIONS OF TRAFFIC CONTROL DEVICES SHALL BE DETERMINED BY THE SEQUENCE OF THE CONTRACTOR'S OPERATIONS. TRAFFIC CONTROL DEVICES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
7. ALL WARNING SIGNS ARE TO BE 48" x 48", BLACK ON ORANGE WITH HIGH INTENSITY OR "DIAMOND GRADE" RETROREFLECTIVE SHEETING. ALL BLACK ON ORANGE WORK ZONE TRAFFIC CONTROL SIGNS, ORANGE AND WHITE TYPE I, TYPE II AND TYPE III BARRICADES, DETOUR ROUTE MARKERS AND ALL OTHER RIGID SIGNS INSTALLED TO CONTROL AND DIRECT TRAFFIC DURING CONSTRUCTION OPERATIONS SHALL BE CONSTRUCTED OF HIGH INTENSITY OR "DIAMOND GRADE" RETROREFLECTIVE SHEETING.
8. THE CONTRACTOR SHALL FOLLOW THIS TRAFFIC CONTROL PLAN ALONG WITH THE SPECIAL PROVISIONS.
9. ALL TRAFFIC CONTROL DEVICES SHALL BE REMOVED OR COVERED AS SOON AS THEY ARE NO LONGER REQUIRED OR APPROPRIATE.
10. THE INITIAL CONSTRUCTION SIGNING SHALL BE ERECTED PRIOR TO BEGINNING CONSTRUCTION OPERATIONS THAT WILL AFFECT THE TRAVELING PUBLIC.

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: Howard D. Smith, P.E.

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO: 46875



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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.: 1532

STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

TRAFFIC CONTROL NOTES

SHEET NO. 3 OF 54

I:\PWU\ENGINEER\PROJECTS\1500-1999\1532-48th Ave. E. Gas Main\23-ACAD-DRAWINGS\1532 SWPPP.dwg

EROSION CONTROL NOTES

1. MNDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION SHALL APPLY. ALONG WITH THE (A.) CITY OF DULUTH OR (B.) DEVELOPER, THE CONTRACTOR WILL BE CO-PERMITEE FOR THE MPCA NPDES STORM WATER CONSTRUCTION PERMIT FOR THIS PROJECT – CONTRACTORS SIGNATURE ON PERMIT IS REQUIRED.
- 1.1. SUBMIT INITIAL EROSION CONTROL (EC) SCHEDULE AT OR BEFORE THE PRECONSTRUCTION CONFERENCE.
- 1.2. SUBMIT EC SCHEDULE ALTERATIONS/ADJUSTMENTS WEEKLY THEREAFTER FOR ENGINEER’S APPROVAL.
2. THE CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL QUALITY CONTROL (WC) ON THIS PROJECT. CONTRACTOR SHALL PHASE/SEQUENCE THE PROJECT TO MINIMIZE EXPOSURE TO EROSION. CONTRACTOR SHALL PLACE OR OTHERWISE CONSTRUCT EROSION CONTROL AND SEDIMENT CONTAINMENT DEVICES TO MINIMIZE THE RUNOFF, TRACKING, AND SEDIMENT LOSS FROM DISTURBED AREAS OF THE PROJECT SITE.
3. DISTURBED SLOPES NOT ACTIVELY WORKED SHALL BE PROTECTED FROM SOIL EROSION WITH TEMPORARY OR PERMANENT COVER WITHIN 3 DAYS OF BEING WORKED. EROSION CONTROL BLANKET AND SOIL STAPLES SHALL BE USED.
4. AT MINIMUM, THE FOLLOWING CONTROLS WILL BE IMPLEMENTED AT THE CONSTRUCTION SITE:
- 4.1. EROSION CONTROL BLANKETS SHALL BE USED ON ALL SLOPES 1:3 OR STEEPER
- 4.2. SILT FENCES SHALL BE USED IN CONJUNCTION WITH OTHER EROSION BMPS
- 4.3. ROCK DITCH CHECKS OR APPROVED EQUAL ARE TO BE USED TO REDUCE DITCH VELOCITIES AND REDUCE EROSION
- 4.4. STORM INLET AND OUTLET AREAS SHALL BE CONTINUOUSLY PROTECTED WITH MNDOT APPROVED DEVICES/METHODS
- 4.5. STABILIZED CONSTRUCTION ENTRANCE, OR REUSABLE MUD MAT SHALL BE USED TO REDUCE SEDIMENT TRACKING
- 4.6. PERMANENT VEGETATION WILL BE ESTABLISHED RIGHT AFTER TOPSOIL IS SPREAD
- 4.7. CONTROL ALL SITE SOLID WASTE, DEBRIS, MATERIAL STORAGE AND CONCRETE WASHOUT ON SITE. NO MIGRATION OFFSITE OR INTO DITCHES/STORM SYSTEMS PERMITTED
5. ALL SLOPES AND DITCHES SHALL BE STABILIZED PRIOR TO OPENING NEW CULVERTS INTO EXISTING DRAINAGE WAYS.
6. STOCKPILED MATERIAL IS TO REMAIN IN PLACE FOR MORE THAN 3 DAYS SHALL HAVE PERIMETER SEDIMENT CONTROL INSTALLED IMMEDIATELY AND SEDIMENT AND EROSION CONTROL DEVICES SHALL BE INSTALLED WITHIN 3 DAYS.
7. WATER PUMPED OR OTHERWISE DISCHARGED FROM THE SITE DURING CONSTRUCTION DEWATERING SHALL BE DIRECTED THROUGH EFFECTIVE FILTERING DEVICE(S) IN ACCORDANCE WITH MNDOT SPECIFICATION 2573. USE OF APPROVED FLOCCULENT MAY BE NECESSARY.
8. THE CONTRACTOR SHALL TAKE ALL POSSIBLE PRECAUTIONS TO PREVENT APPRECIABLE SOIL TRACKING ONTO ROADWAYS. APPRECIABLE SOIL, MUD, OR DEBRIS WASHED, TRACKED, OR DEPOSITED ONTO PAVED SURFACES SHALL BE REMOVED PRIOR TO THE END OF EACH WORK DAY.
9. STABILIZED CONSTRUCTION ENTRANCE(S) SHALL BE REMOVED AND AREA RESTORED AFTER GRADING IS COMPLETE.
10. THE CONTRACTOR QC PROGRAM SHALL ENSURE THAT A COMPETENT INDIVIDUAL SHALL INSPECT EROSION AND SEDIMENT CONTROL DEVICES WEEKLY AND AFTER EACH RAIN EVENT. ALL NONFUNCTIONAL DEVICES SHALL BE REPAIRED/REPLACED/CLEANED. MAINTAIN WRITTEN LOG OF ALL WEEKLY AND RAIN EVENT INSPECTIONS – INCLUDE THE CORRECTIVE ACTIONS THAT WERE TAKEN.
11. THE CONTRACTOR SHALL MAINTAIN THE CAPABILITY TO IMPLEMENT RAPID STABILIZATION METHOD 4 (MNDOT 2573.4) AT ALL TIMES. INCLUDES CAT III EROSION CONTROL BLANKED (ECB) [N. AMERICAN GREEN S150 OR APPROVED EQUAL] ALONG WITH SEED MIXTURE, FERTILIZER, AND SOIL STAPLES PER 2573-3. THE UPGRADE END OF EACH BLANKET STRIP SHALL BE BURIED AT LEAST 6 INCHES IN A VERTICAL CHECK SLOT. STAPLES SHALL BE PLACED AT SEAMS AND THROUGHOUT THE BLANKET AT A MAXIMUM SPACING IN ALL DIRECTIONS OF 2 FEET. PAYMENT ALLOWED SHALL BE PER CONTRACT OR IN ABSENCE OF CONTRACT BID PRICE IN ACCORDANCE WITH MNDOT SPECIFICATION 2575.5
12. THE CONTRACTOR SHALL BE PROACTIVE IN THEIR APPROACH TO MINIMIZING SOIL EROSION AND SEDIMENT TRANSPORT FROM THE SITE. CURRENT TECHNOLOGY FOR WEATHER FORECASTING AND WEATHER RADAR ALLOWS FOR THE CONTRACTOR TO HAVE EROSION CONTROL BMPS INSTALLED AND FUNCTIONING FOR A RAIN EVENT. ALL CONSTRUCTION SITES SHALL BE PREPARED FOR A RAIN EVENT DURING NON-WORK TIMES, I.E. WEEK NIGHTS AND WEEKENDS.
13. AS SITE CONDITIONS CHANGE, THE WORK PROGRESSES AND WEATHER CONDITIONS VARY, THE CONTRACTOR SHALL BE REACTIVE TO THESE CHANGING VARIABLES.. THEREFORE BMP INSTALLATION, CLEANING AND RELOCATION SHOULD BE ANTICIPATED IN MOST CONSTRUCTION ACTIVITIES.

CONSTRUCTION PRACTICES TO MINIMIZE STORM WATER CONTAMINATION

TO PREVENT STORM WATER CONTAMINATION FROM OCCURRING, THE FOLLOWING BMPS WILL BE IMPLEMENTED:

1. ALL AREAS THAT ARE ROUGH GRADED MUST BE KEPT IN A SMOOTH CONDITION TO ALLOW SHEET FLOW OF STORM WATER WHEREVER PRACTICAL AND ALWAYS READY FOR SURFACE APPLICATION OF DEGRADABLE OR NON-DEGRADABLE BLANKETS, MULCH, OR OTHER PROTECTIVE COVERS.
2. A STABILIZED CONSTRUCTION ENTRANCE/EXIT WILL BE CONSTRUCTED TO REDUCE VEHICLE TRACKING OF SEDIMENTS OFF THE PROJECT RIGHT OF WAY.
3. ALL SOLID WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER OR OTHER APPROVED CONTAINMENT METHOD AT THE END OF EACH DAY. ANY ALTERNATIVE TO A METAL DUMPSTER MUST BE SUBMITTED IN WRITING FOR APPROVAL BY THE PROJECT ENGINEER. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER WILL BE EMPTIED AS NECESSARY TO FUNCTION AS INTENDED FOR DEBRIS COLLECTION. NO CONSTRUCTION MATERIALS WILL BE BURIED ON-SITE. THE CONTRACTOR’S EROSION CONTROL SUPERVISOR WILL INSTRUCT ALL PERSONNEL REGARDING THE CORRECT PROCEDURE FOR DISPOSAL.
4. RECYCLABLE MATERIALS MUST BE SEPARATED ON-SITE AND SEGREGATED IN DESIGNATED CONTAINERS.
5. A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR WILL COLLECT ALL SANITARY WASTE FROM THE PORTABLE UNITS AT A RATE NECESSARY TO MAINTAIN DESIGNED FUNCTION.
6. ALL VEHICLES ON SITE WILL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE.
7. FERTILIZERS WILL BE STORED IN A COVERED SHED AND PARTIALLY USED BAGS WILL BE TRANSFERRED TO A SEALABLE BIN TO REDUCE THE CHANCE OF SPILLAGE.
8. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS, WHICH ARE CLEARLY LABELED.
9. SPILL KITS WILL BE INCLUDED WITH ALL FUELING SOURCES AND MAINTENANCE ACTIVITIES. SECONDARY CONTAINMENT MEASURES WILL BE INSTALLED AND MAINTAINED BY THE CONTRACTOR.
10. ANY ASPHALT SUBSTANCES USED ON SITE WILL BE APPLIED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
11. ALL PAINT CONTAINERS AND CURING COMPOUNDS WILL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE. EXCESS PAINT WILL NOT BE DISCHARGED TO THE STORM WATER SYSTEM BUT WILL BE PROPERLY DISPOSED OF ACCORDING TO MANUFACTURER’S INSTRUCTION.
12. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEAN-UP SHALL BE READILY AVAILABLE AND BE KEPT IN AN ENCLOSED TRAILER OR SHED ON SITE. EQUIPMENT WILL INCLUDE, BUT NOT LIMITED TO, BROOMS, MOPS, DUST PANS, RAGS, GLOVES, GOGGLES, ABSORBENT (KITTY LITTER, OIL ABSORBENT BOOMS AND DIAPERS) AND BUCKETS.
13. ALL SPILLS WILL BE CONTAINED AND CLEANED UP IMMEDIATELY UPON DISCOVERY. SPILLS LARGE ENOUGH TO REACH THE STORM WATER CONVEYANCE SYSTEM WILL BE REPORTED TO THE MINNESOTA DUTY OFFICER AT 1-800-422-0798.
14. CONCRETE TRUCKS WILL NOT BE ALLOWED TO WASH OUT OR DISCHARGE SURPLUS CONCRETE OR DRUM WASH WATER ON THE SITE UNLESS DONE IN AN ENGINEERED CONTAINMENT SYSTEM. THE ENGINEERED SYSTEM MUST INCLUDE SITE DRAWINGS FOR THE PROJECT FILE AND WRITTEN ASSURANCE THAT THE SYSTEM WILL WORK AS DESIGNED AND LEAVE NO DISCHARGE OF CONCRETE OR CONCRETE RESIDUE POTENTIAL TO ENTER WATERS OF THE STATE.
15. FORM RELEASE OIL USED FOR CONCRETE WORK MUST BE APPLIED OVER A PALLET CONTAINING ABSORBENT TO COLLECT EXCESS LIQUID. THE ABSORBENT MATERIAL WILL BE REPLACED AND PROPERLY DISPOSED OF WHEN SATURATED.
16. DISCHARGES FROM BASIN DEWATERING OPERATIONS THAT ARE TURBID OR SEDIMENT LADEN SHALL BE DISCHARGED TO TEMPORARY SEDIMENT BASINS CONSTRUCTED ON THE SITE TO PROVIDE TREATMENT PRIOR TO DISCHARGE TO A WATER OF THE STATE.

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: Howard D. Smith, P.E.

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO: 46875



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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.:

1532

STATE AID PROJECT NO.:

NA

DRAWN BY: J.R.L.

SWPPP 1

SHEET NO. 4 OF 54

I:\PWU\ENGINEER\PROJECTS\1500-1999\1532_48th Ave. E. Gas Main\23-ACAD-DRAWINGS\1532 SWPPP.dwg

NPDES STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

1. THE PROJECT WILL RECONSTRUCT EXISTING CITY STREETS AND ASSOCIATED INFRASTRUCTURE INCLUDING:

1.1. GRADING AND EXCAVATION

1.2. TRENCHING FOR NEW AND RECONSTRUCTED UTILITIES

1.3. NEW CURB AND GUTTER

1.4. NEW BITUMINOUS AND CONCRETE PAVEMENT

1.5. TURF ESTABLISHMENT.
2. THE TOTAL LAND AREA ANTICIPATED TO BE DISTURBED BY THE PROJECT (EXCLUSIVE OF BORROW AND DISPOSAL AREAS) IS 1.7 ACRES.

3. CONSTRUCTION DATES ARE ESTIMATED TO BE FROM MAY 1, 2017 TO OCTOBER 20, 2017.

4. THE RECEIVING WATER FOR STORM WATER FROM THE PROJECT INCLUDES EXISTING STORM SEWER SYSTEMS LEADING TO ST. LOUIS BAY & LAKE SUPERIOR.

5. CITY OF DULUTH MAINTENANCE IS RESPONSIBLE FOR LONG TERM OPERATION AND MAINTENANCE OF THE STORM WATER SYSTEM.

6. CONTACTS:

OWNER & RECORDS RETENTION:

CITY OF DULUTH

ENGINEERING DEPARTMENT

211 CITY HALL

DULUTH, MN 55802

(218) 730-5200

THE CITY OF DULUTH PROJECT ENGINEER IS: HOWARD D. SMITH

PROJECT ENGINEER

211 CITY HALL

DULUTH, MN 55802

(218) 730-5092

hsmith@duluthmn.gov

TIMING OF 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, AND SHALL MEET THE NPDES PERMIT PART IV CONSTRUCTION ACTIVITY REQUIREMENTS.
2. TEMPORARY PERIMETER CONTROL BMPs WILL BE INSTALLED BEFORE ANY UP GRADIENT SOIL DISTURBANCE OCCURS.
3. PERMANENT AND TEMPORARY SEDIMENT TRAPS AND BASINS (IF APPLICABLE) WILL BE CONSTRUCTED BEFORE ANY CONVEYANCE OR DEWATERING OCCURS.
4. TOPSOIL AND TEMPORARY EROSION CONTROL BMPs SHALL BE PLACED WITHIN 3 DAYS OF COMPLETION OF EMBANKMENT
5. PLACEMENT OF RIPRAP SHALL BE COMPLETED WITHIN 24 HOURS OF CULVERT PLACEMENTS AND DONE IN ONE CONTINUOUS OPERATION.
6. ONCE CONSTRUCTION ACTIVITY CEASES FOR 3 DAYS OR MORE IN AN AREA, THAT AREA WILL BE STABILIZED WITH TEMPORARY OR PERMANENT BMPs FOR EROSION.

CALCULATIONS

TOTAL DISTURBED AREA = 1.7 ACRES

POST CONSTRUCTION IMPERVIOUS AREA = .10 ACRES

EXISTING IMPERVIOUS AREA = .11 ACRES

IMPERVIOUS NET = .1 ACRES (INCREASE/DECREASE)

SOILS INFORMATION: N/A

CONSTRUCTION NOTES

- CONSTRUCTION SHALL BE GOVERNED BY THE MNDOT STANDARD SPECIFICATIONS, CITY OF DULUTH STANDARD CONSTRUCTION SPECIFICATIONS AND SPECIAL PROVISIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF THE SWPPP AND THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION AND SEDIMENT CONTROL BMPs BEFORE AND DURING CONSTRUCTION.
- THE CONTRACTOR SHALL KEEP WRITTEN INSPECTION AND MAINTENANCE LOGS (INCLUDING ALL CLEAN OUT AND CORRECTIVE ACTIONS) IN ACCORDANCE WITH THIS SWPPP AND ALL PERMITS.

TMDL IMPLEMENTATION PLANS CONTAINING STORM WATER REQUIREMENTS

NO TMDL IMPLEMENTATION PLANS CURRENTLY EXIST FOR THE RECEIVING WATERS ON THIS PROJECT.
THE ST. LOUIS RIVER IS LOCATED ?? MILES FROM THE PROJECT AND IS AN MPCA LISTED IMPAIRED WATER.

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN		
DESCRIPTION	TITLE	LOCATION
SUMMERY OF PERVIOUS & IMPERVIOUS	SWPPP	SWPPP 2
DIRECTION OF FLOW/DRAINAGE AREA	EROSION CONTROL	EROSION CONTROL
RECEIVING SURFACE WATERS	PLAN & PROFILE	—
NO DISTURBANCE AREAS & AREAS OF CONSTRUCTION	PLAN & PROFILE SHEETS	PLAN & PROFILE SHEETS
DRAINAGE STRUCTURES	PLAN & PROFILE	—
DRAINAGE TABULATIONS	N/A	N/A
EROSION CONTROL TABULATIONS	S.E.Q.	—
EROSION CONTROL SHEETS	EROSION CONTROL SHEETS	—
EROSION CONTROL DETAILS	DETAILS	—
SEDIMENT CONTROL PRACTICES	DETAILS	—
FINAL STABILIZATION	N/A	
SEDIMENT BASIN (POND) TABULATIONS	N/A	N/A
POND SHEETS (SEDIMENT BASINS	N/A	N/A
LOCATION OF PONDS	N/A	N/A

SWPPP IMPLEMENTATION CONTACTS			
AGENCY	PERMIT	NAME	PHONE/E-MAIL
CONTRACTOR'S EROSION CONTROL SUPERVISOR		TO BE DETERMINED	TBD
MPCA	NPDES	JIM DEXTER	(218)529-6253 james.dexter@pcs.state.mn.us
SWCD	WCA	RC BOHEIM	(218)723-4629 RC.Boheim@southstlouisswcd.org
MNDNR WATERS AREA HYDROLOGIST	N/A	PATRICIA FOWLER	(218)834-6621 patricia.fowler@dnr.state.mn.us
CORPS OF ENGINEERS	SECTION 404	DARYL WIERZBINSKI	218-834-6630 daryl.w.wierzbinski@mvp02.usa.ce.army.mil
STATE DUTY OFFICER	N/A	MPCA	800-422-0798
CITY REVIEW	N/A	TOM JOHNSON	(218) 730-5103 tjohnson@duluthmn.gov
LGU-CITY OF DULUTH	N/A	KYLE DEMING	(218)730-5580 kdeming@duluthmn.gov
CITY OF DULUTH SOLID WASTE OFFICER	N/A	KAREN O'DONNELL	(218)730-5148 kodennell@duluthmn.gov

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DULUTH, MN 55802

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.:

1532

STATE AID PROJECT NO.:

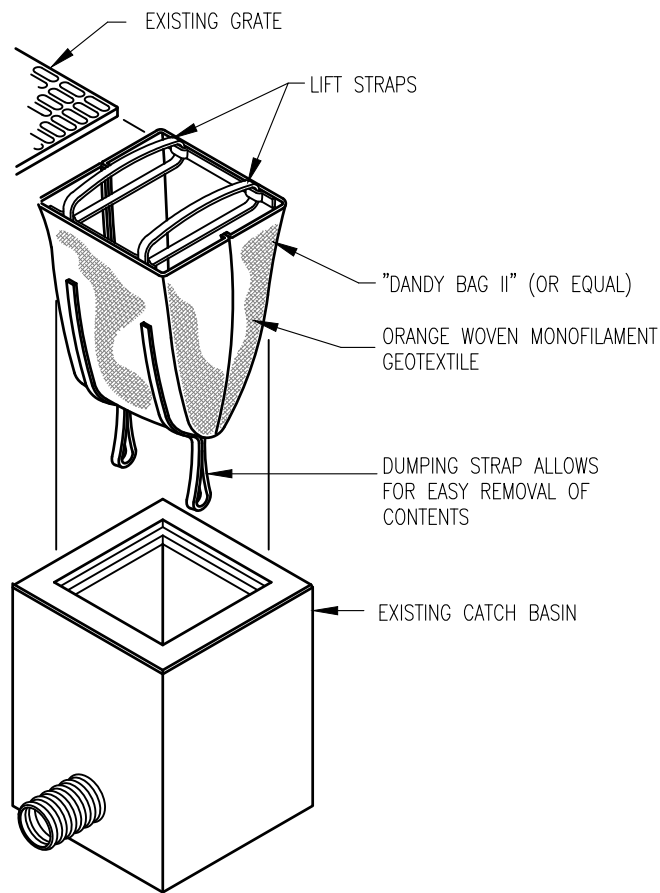
NA

DRAWN BY: J.R.L.

SWPPP 2

SHEET NO. 5 OF 54

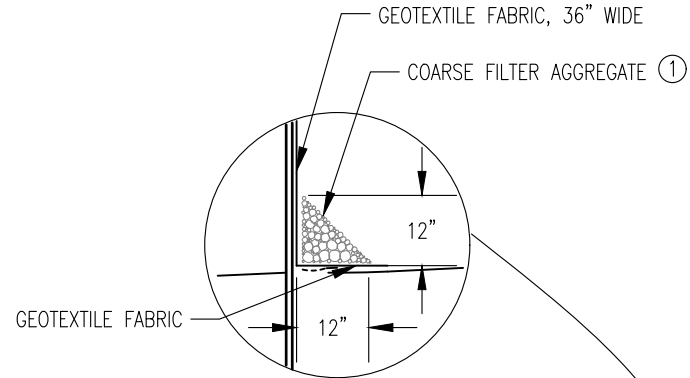
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MAINTENANCE REQUIRED: FOLLOWING EACH RUNOFF EVENT, MONITOR AND, IF NECESSARY, REMOVE ALL ACCUMULATED SEDIMENT & DEBRIS FROM THE UNIT AFTER THE HEIGHT OF THE ACCUMULATED MATERIAL REACHES 1/3 OF THE HEIGHT OF THE SEDIMENT BAG.

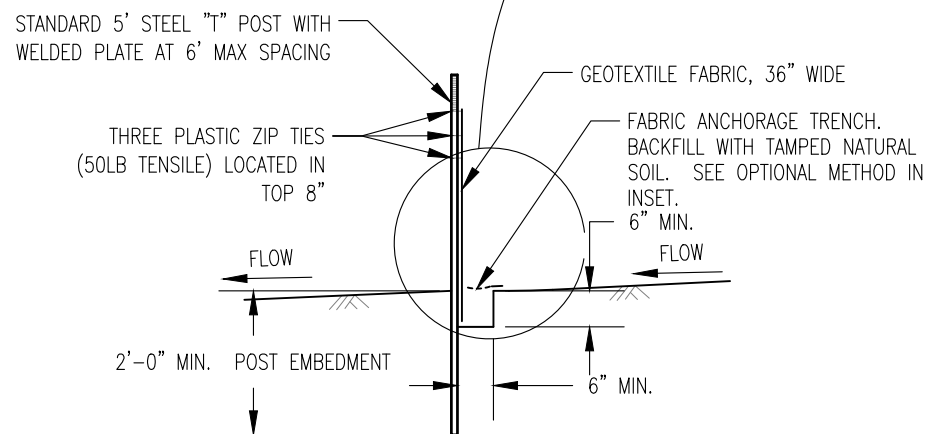
TYPE A
INLET PROTECTION
CATCH BASIN SEDIMENT BAG INSERT TYPE DETAIL

NO SCALE



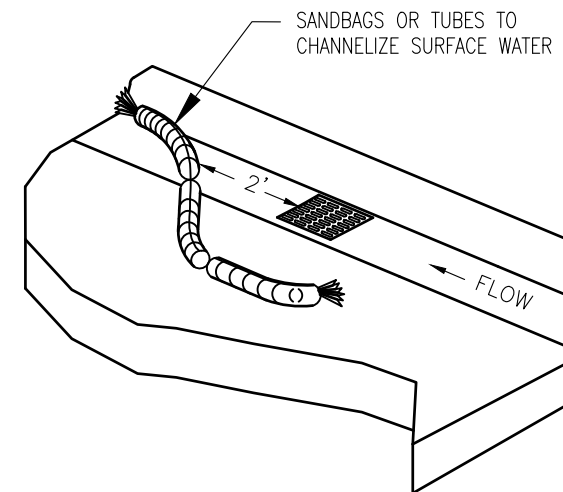
OPTIONAL METHOD
FOR SILT FENCE, HEAVY DUTY

NOTES:
SEE SPECS. 2573, 3149 & 3886.
① COARSE FILTER AGGREGATE (SPEC. 3149.H)
SHALL BE INCIDENTAL.

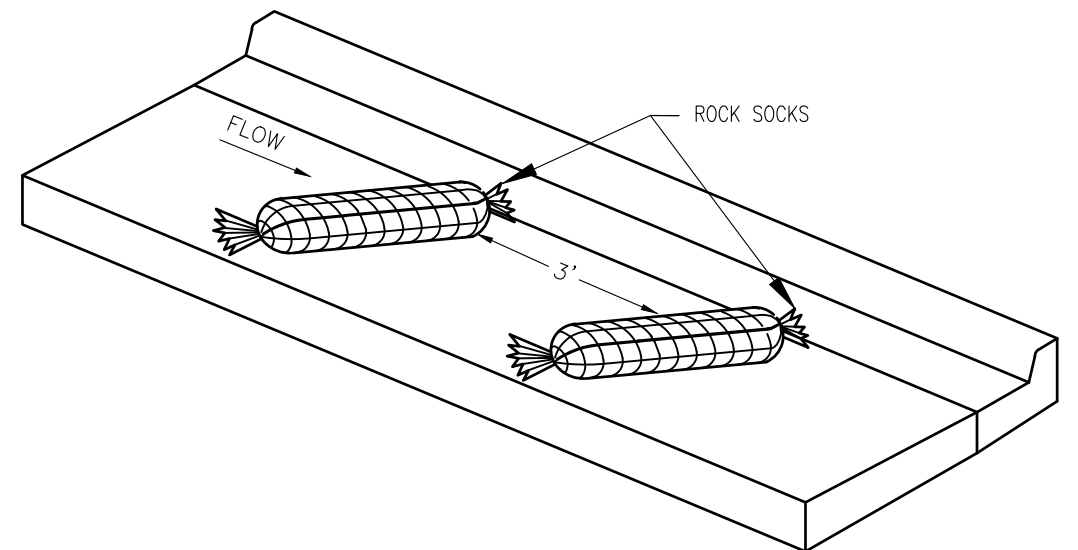


SILT FENCE, HEAVY DUTY
(HAND INSTALLED)

DESIGN GUIDELINES: TO PROTECT AREAS FROM SHEET
FLOW. MAXIMUM CONTRIBUTING AREA: 1 ACRE.



TYPE B
SANDBAG DIVERSION
NO SCALE



TYPE C
GUTTER LINE ROCK CHECKS
NO SCALE

NOTE: ROCK SOCKS SHALL BE CONSTRUCTED OF SUITABLE GEOFABRIC AND 3/4" ROCK

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SIGNATURE:

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HOWARD D. SMITH, P.E.
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DATE: 03/13/2017

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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.: 1532

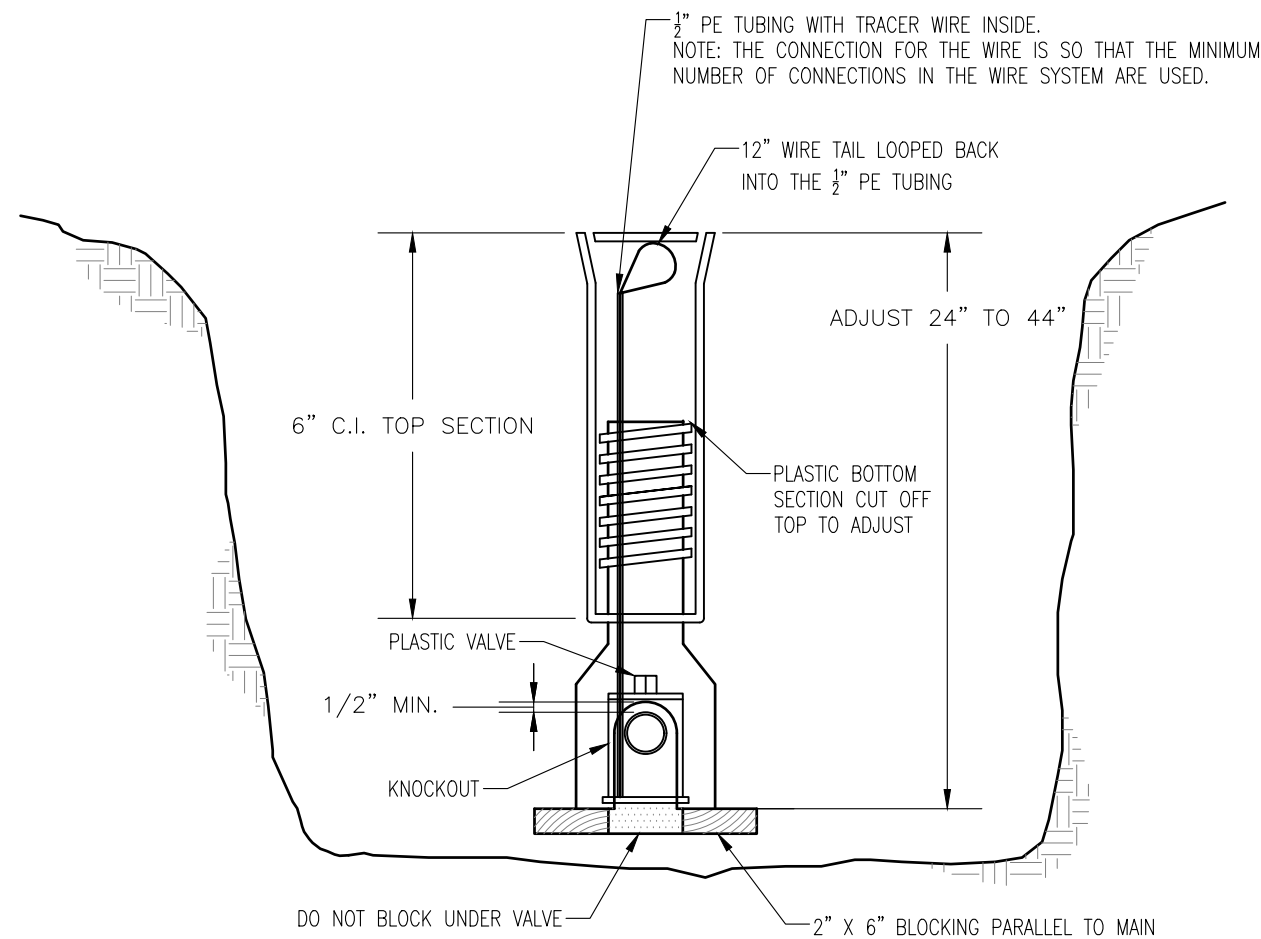
STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

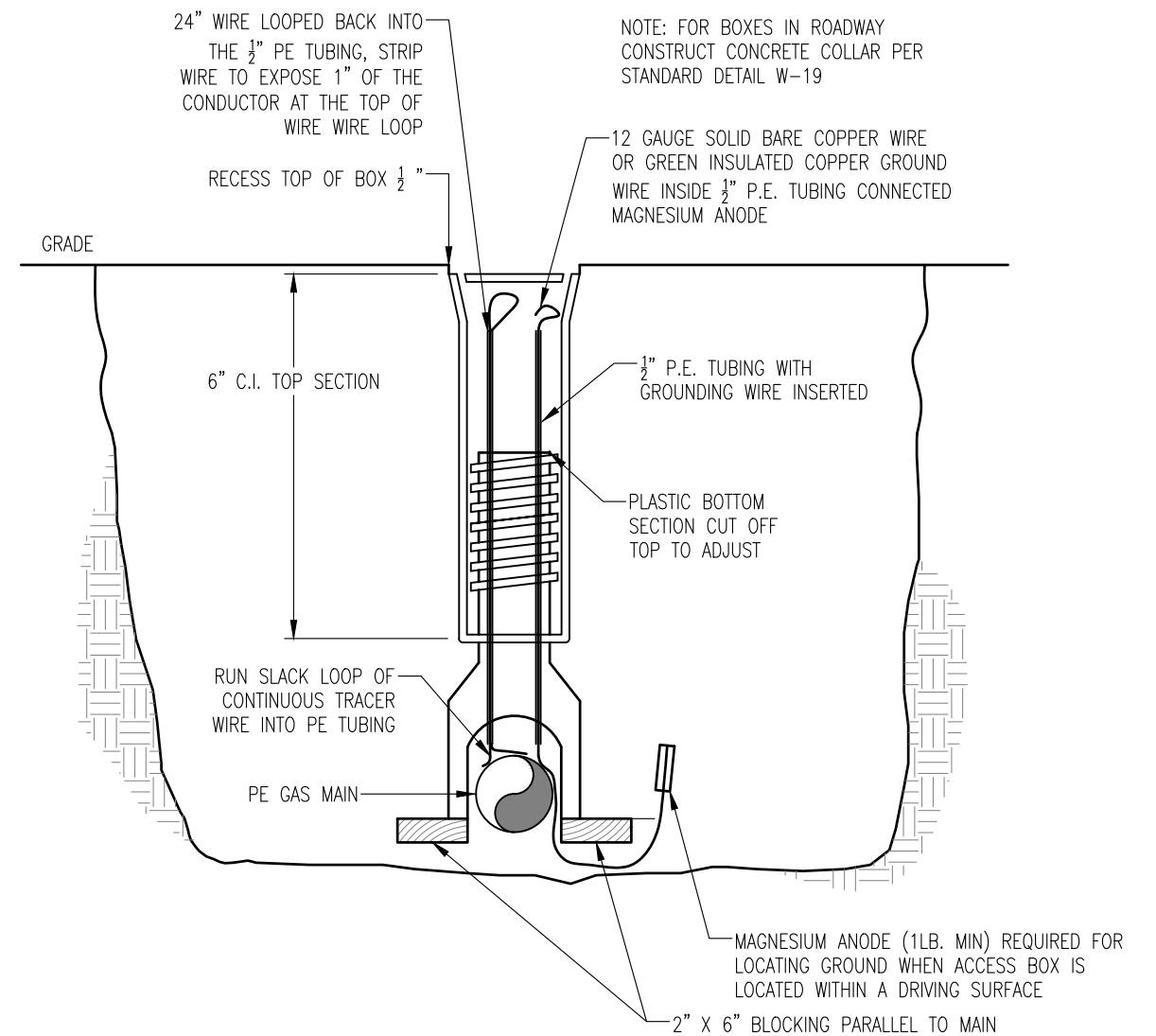
EROSION CONTROL DETAILS

SHEET NO. 6 OF 54

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P.E. VALVE BOX SETTING
N.T.S.



TRACER BOX ACCESS BOX
N.T.S.

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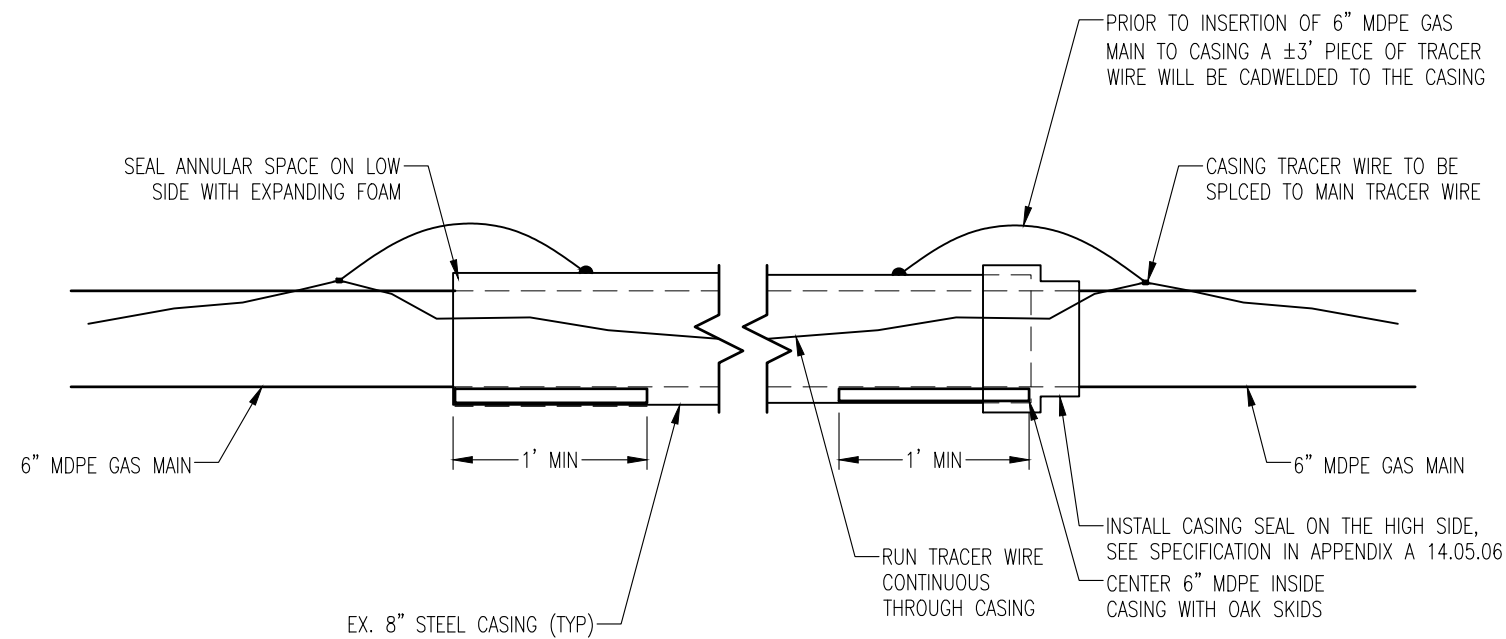
STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

STANDARD GAS DETAILS

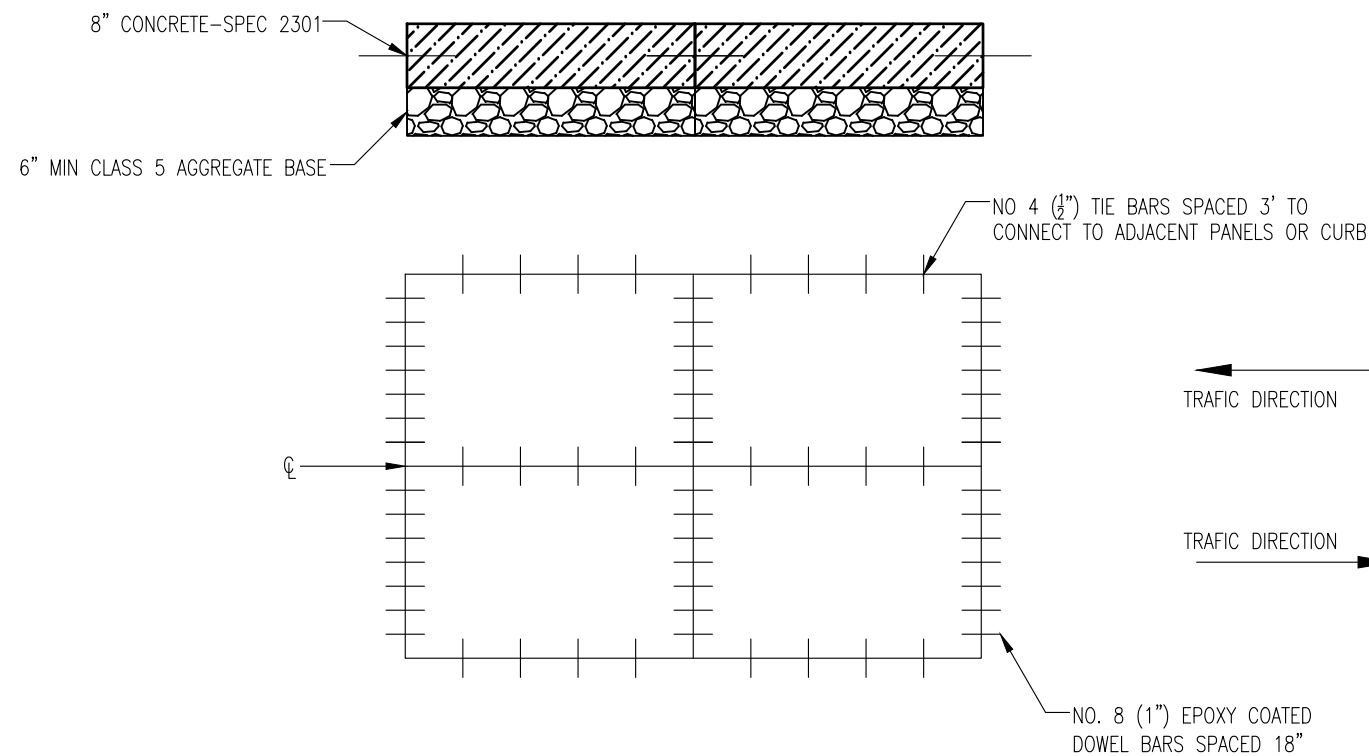
SHEET NO. 7 OF 54

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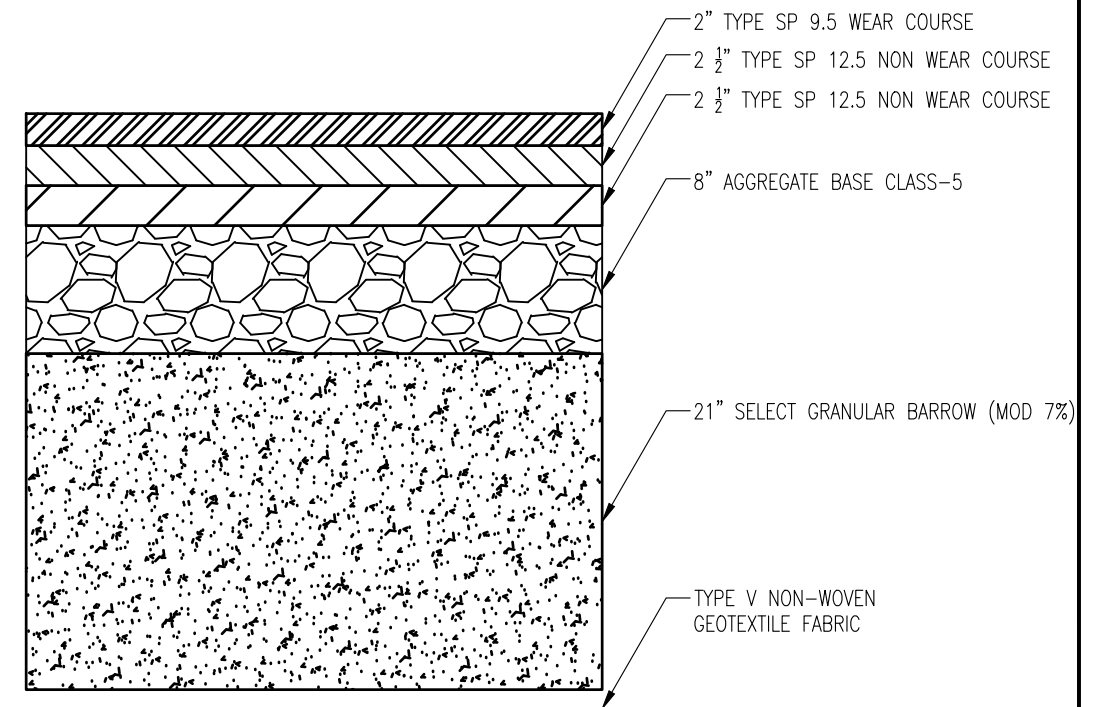


NOTE: CONTRACTOR SHALL REMOVE EXISTING GAS MAIN FROM CASING. THEN CLEAN CASING AND INSPECT WITH TELEVISION TO DOCUMENT CONDITION FOR THE CITY OF DULUTH.

48TH AVE E TYPICAL INSERTION CASING DETAIL

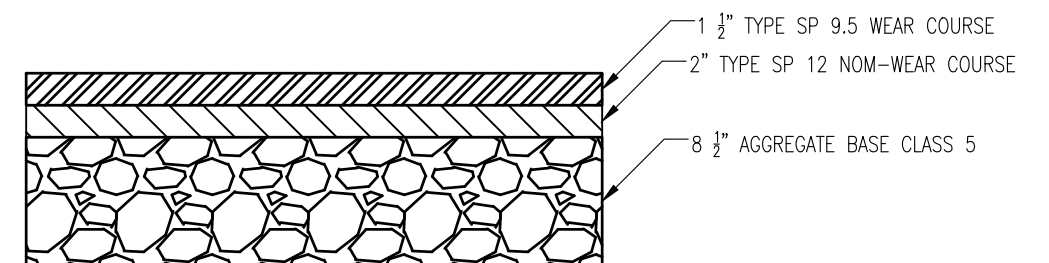


HAWTHORNE RD AND 4TH ST CONCRETE PANEL TYPICAL SECTION

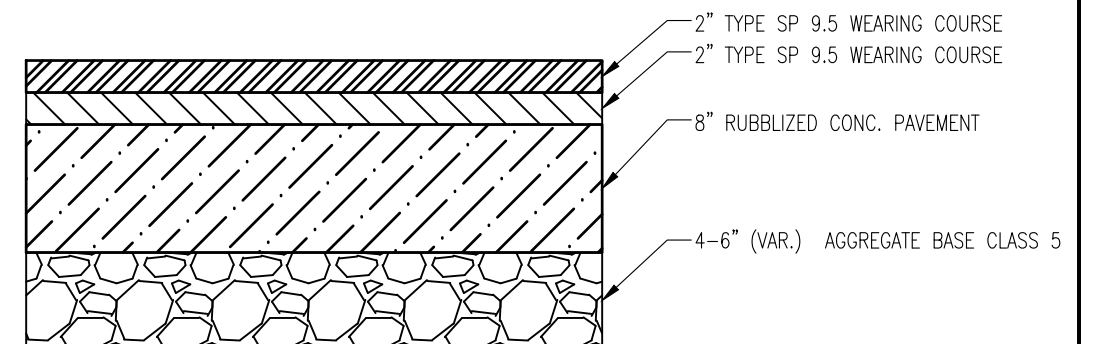


GLENNWOOD RD TYPICAL SECTION

NOTE: CONTRACTOR SHALL PAINT BLUE LAKE WALK CENTERLINE STRIPE WITH MATCHING BLUE EPOXY PAINT INCIDENTAL TO PAVING.



LAKE WALK TYPICAL SECTION



SUPERIOR ST. TYPICAL SECTION

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DULUTH, MN 55802

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.: 1532

STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

CASING AND STREET DETAILS

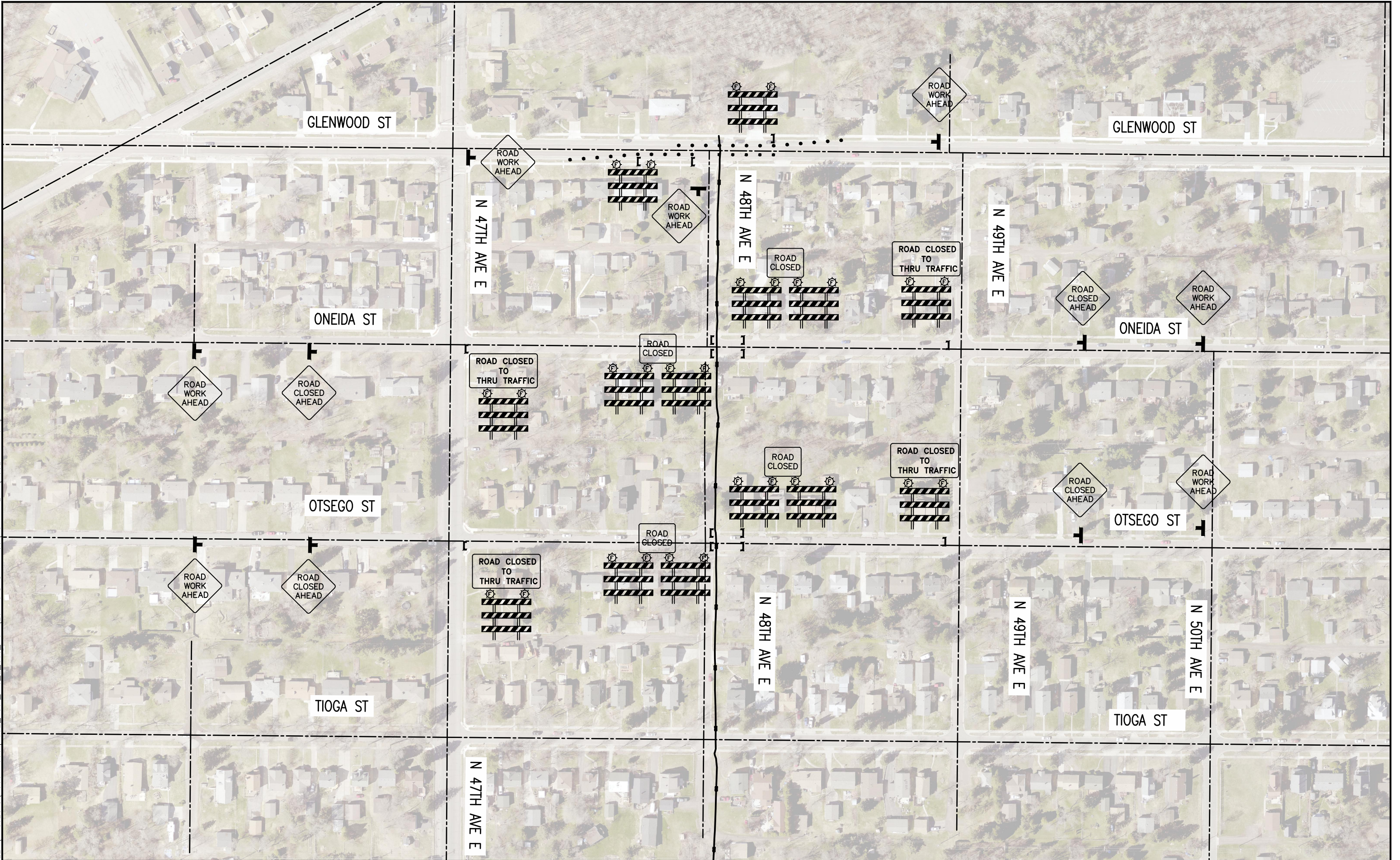
SHEET NO. 8 OF 54



1. WHERE THERE IS NO SIDEWALK OR THERE IS A GRASS BOULEVARD BETWEEN THE SIDEWALK AND THE BACK OF CURB THE CREST OF THE DRIVEWAY MUST BE AT LEAST 6" ABOVE GUTTER TO CONTAIN RUNOFF.

2. WHERE THERE IS SIDEWALK DIRECTLY BEHIND THE CURB, DRIVEWAY PROFILE SLOPE SHALL BE FLATTENED TO MEET ADA ACCESSIBLE ROUTE STANDARDS

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DULUTH, MN 55802

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CITY PROJECT NO.: 1532

STATE AID PROJECT NO.: NA

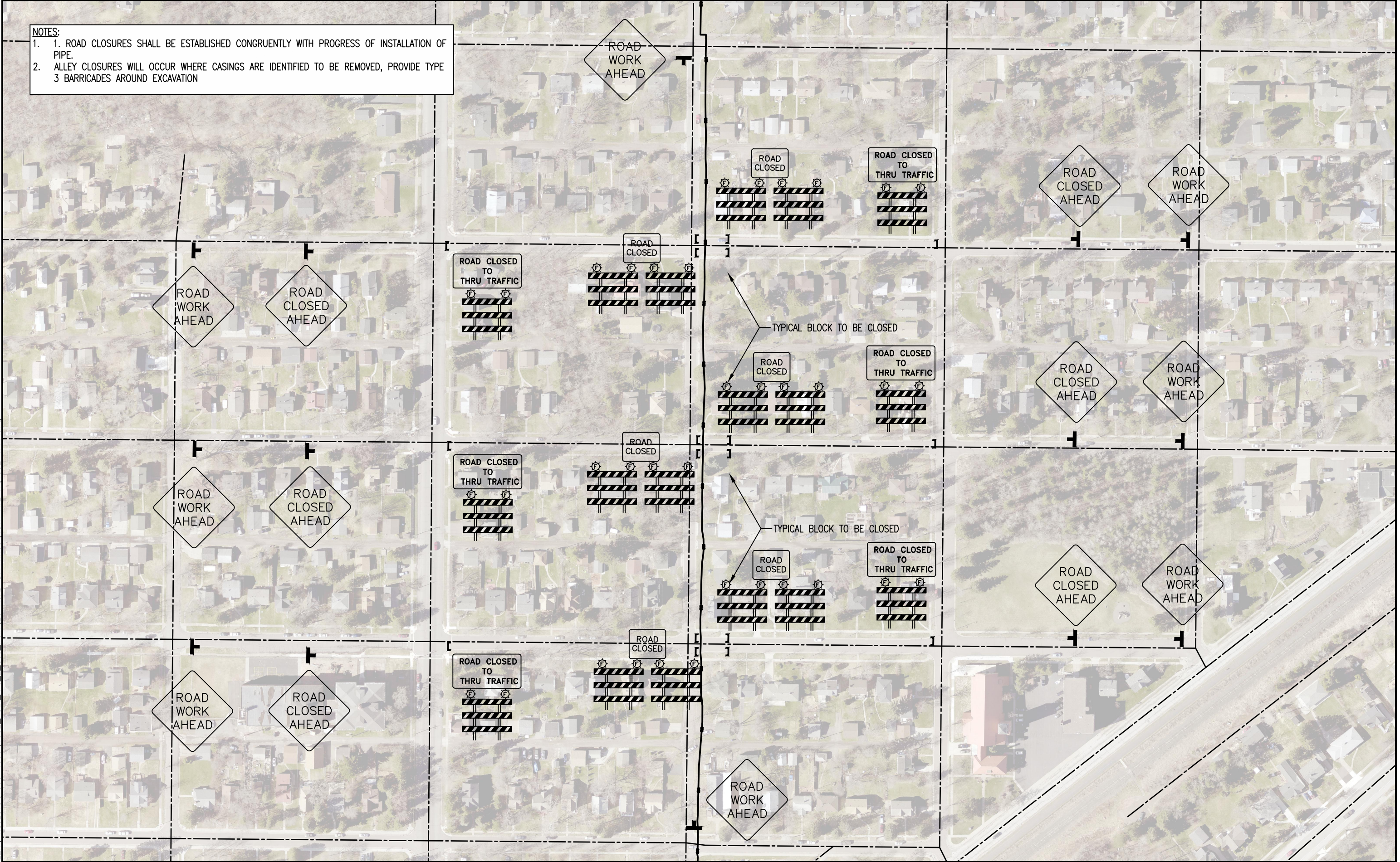
DRAWN BY: J.R.L.

48TH AVE.E. CLOSURE AT GLENWOOD

SHEET NO. 10 OF 54

I:\PW\ENGINEER\PROJECTS\1500-1999\1532-48th Ave. E. Gas Main\23-ACAD-DRAWINGS\48TH AVE W\1532-TRAF.dwg

- NOTES:
1. ROAD CLOSURES SHALL BE ESTABLISHED CONGRUENTLY WITH PROGRESS OF INSTALLATION OF PIPE.
 2. ALLEY CLOSURES WILL OCCUR WHERE CASINGS ARE IDENTIFIED TO BE REMOVED, PROVIDE TYPE 3 BARRICADES AROUND EXCAVATION



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DULUTH, MN 55802

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

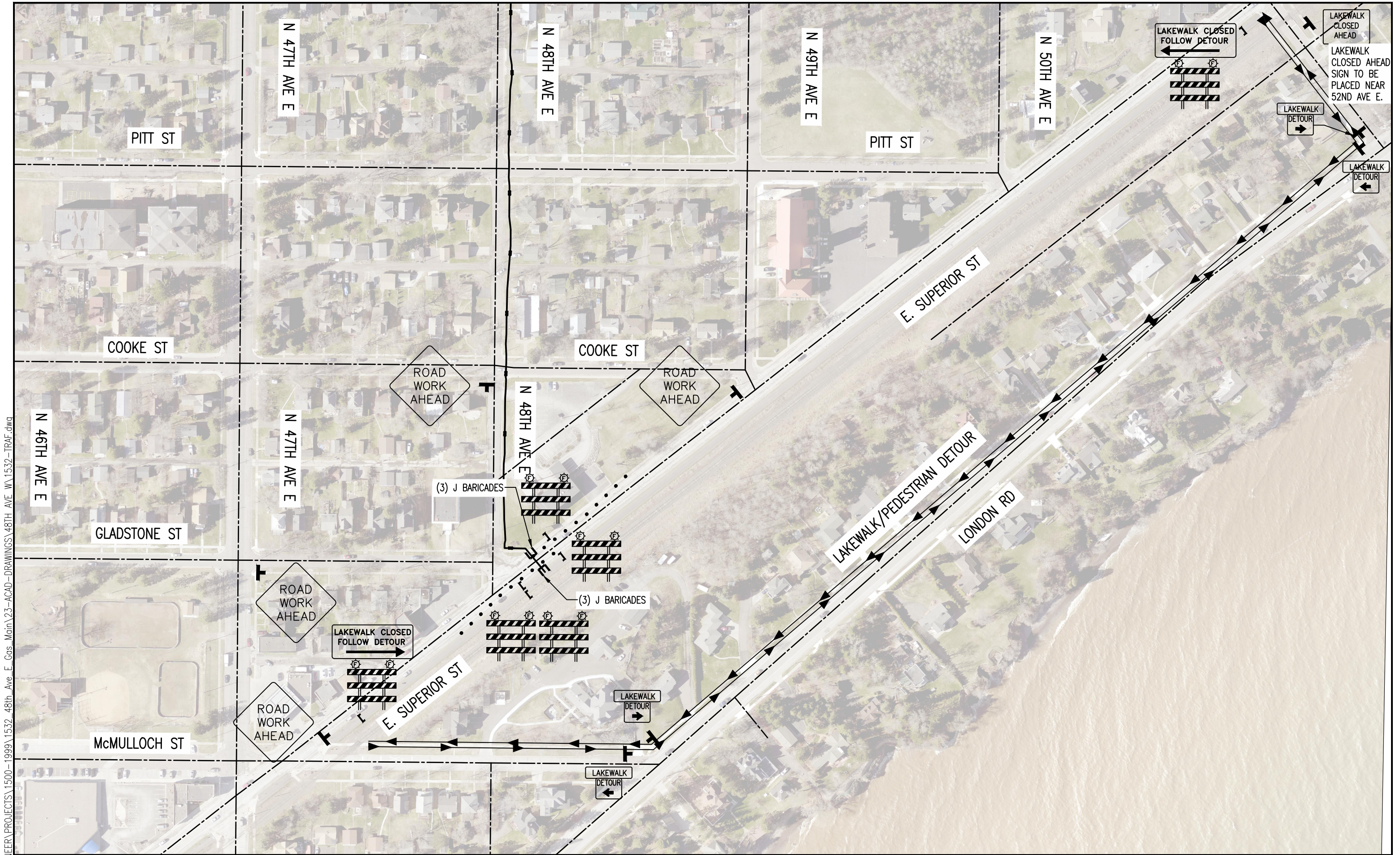
CITY PROJECT NO.: 1532

STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

TYPICAL CLOSURE AT 48TH AVE. E.

SHEET NO. 11 OF 54



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DULUTH, MN 55802

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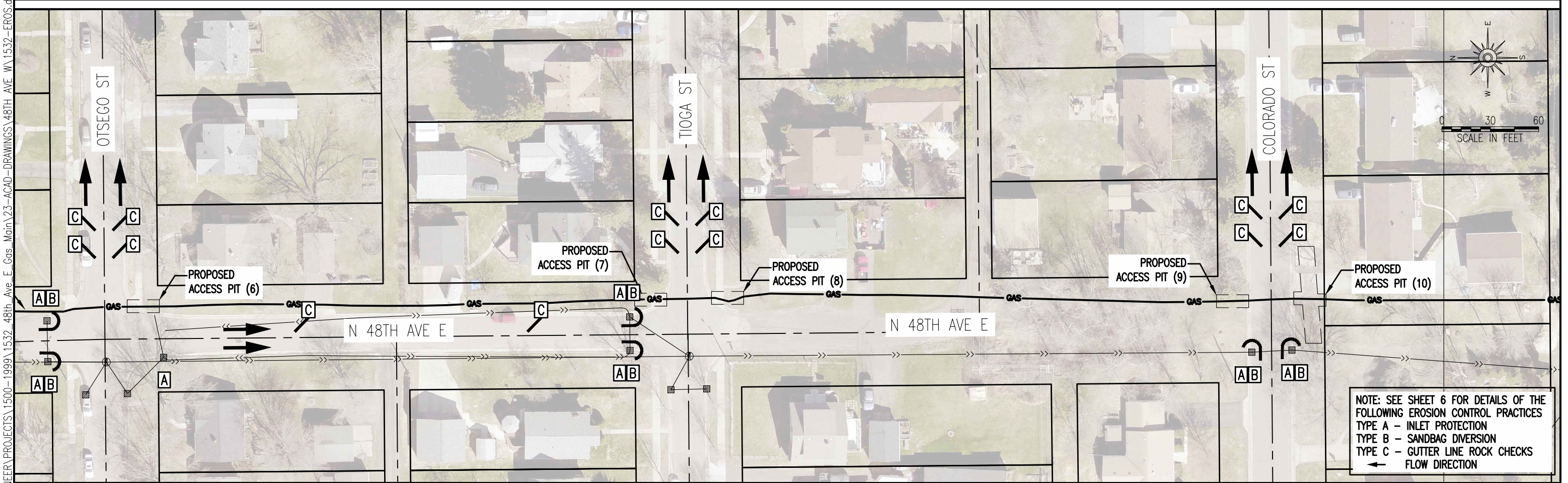
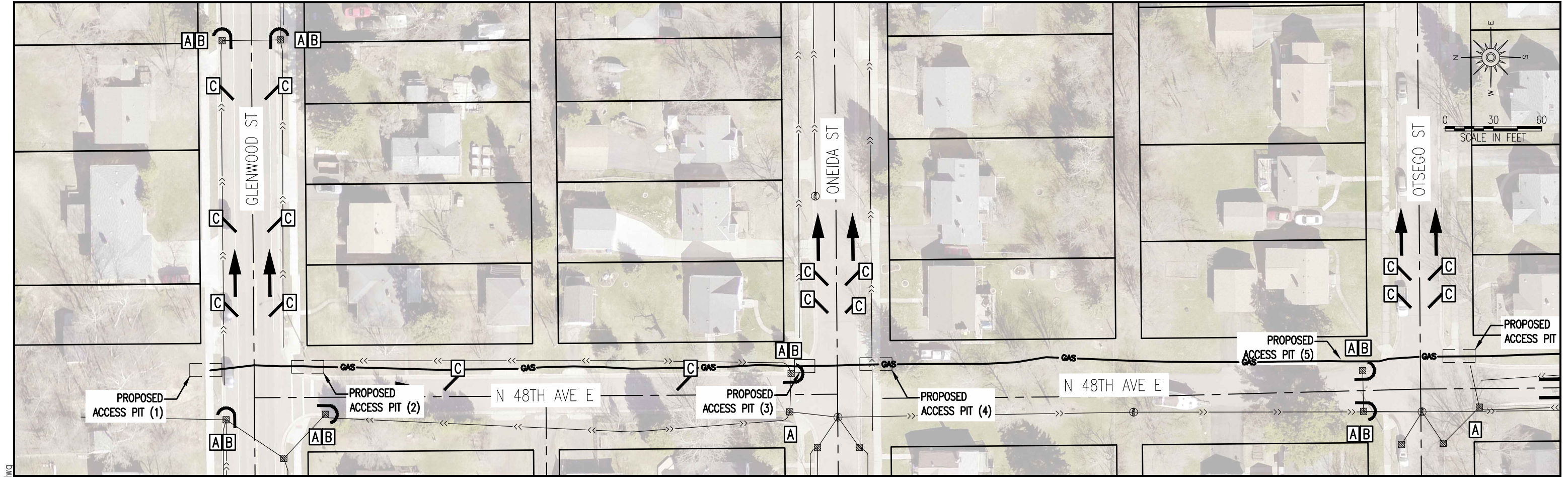
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STATE AID PROJECT NO.: NA

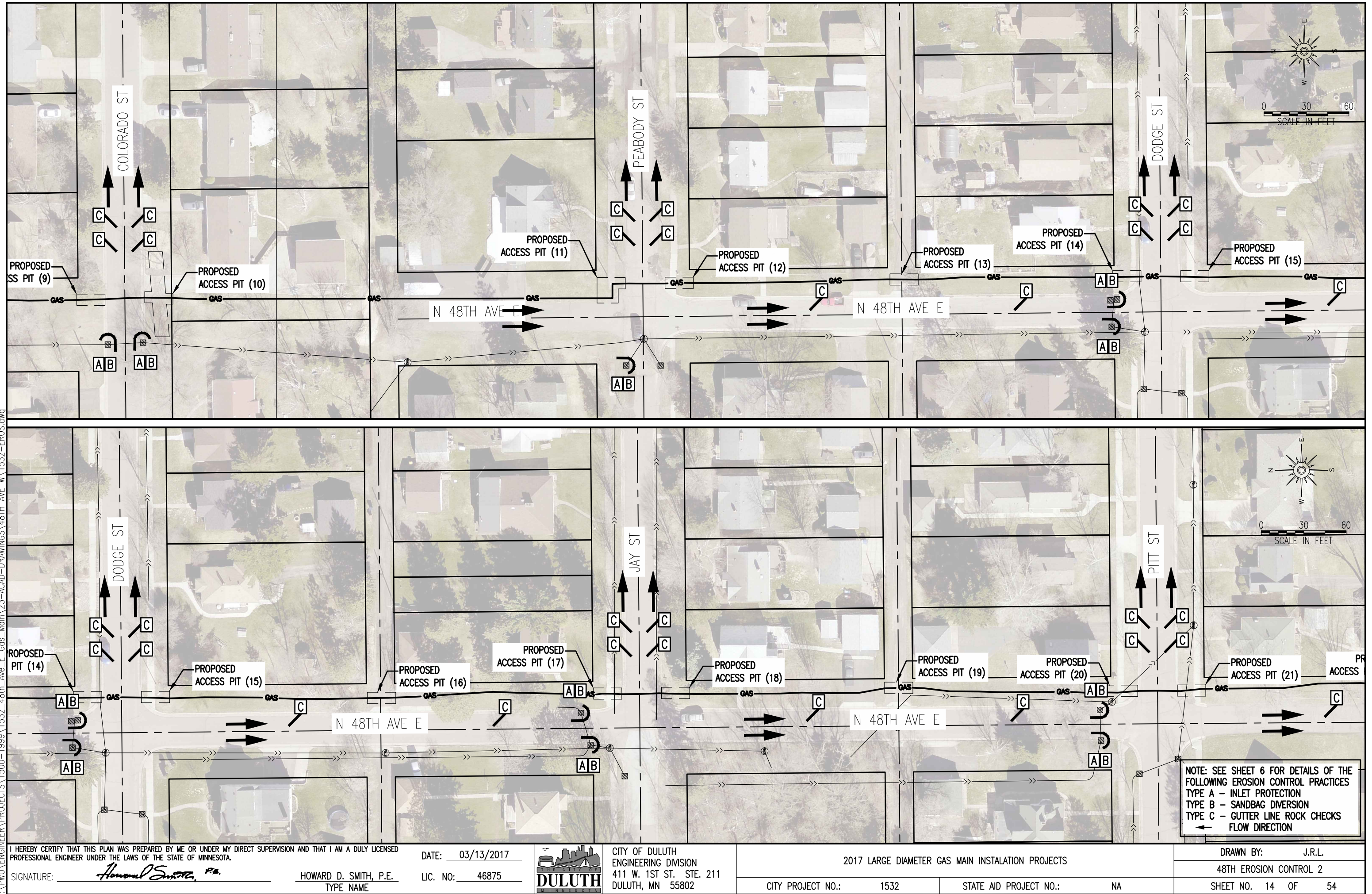
DRAWN BY: J.R.L.

SUPERIOR ST TRAFFIC CONTROL

SHEET NO. 12 OF 54



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

2017 LARGE DIAMETER GAS MAIN INSTALLATION PROJECTS

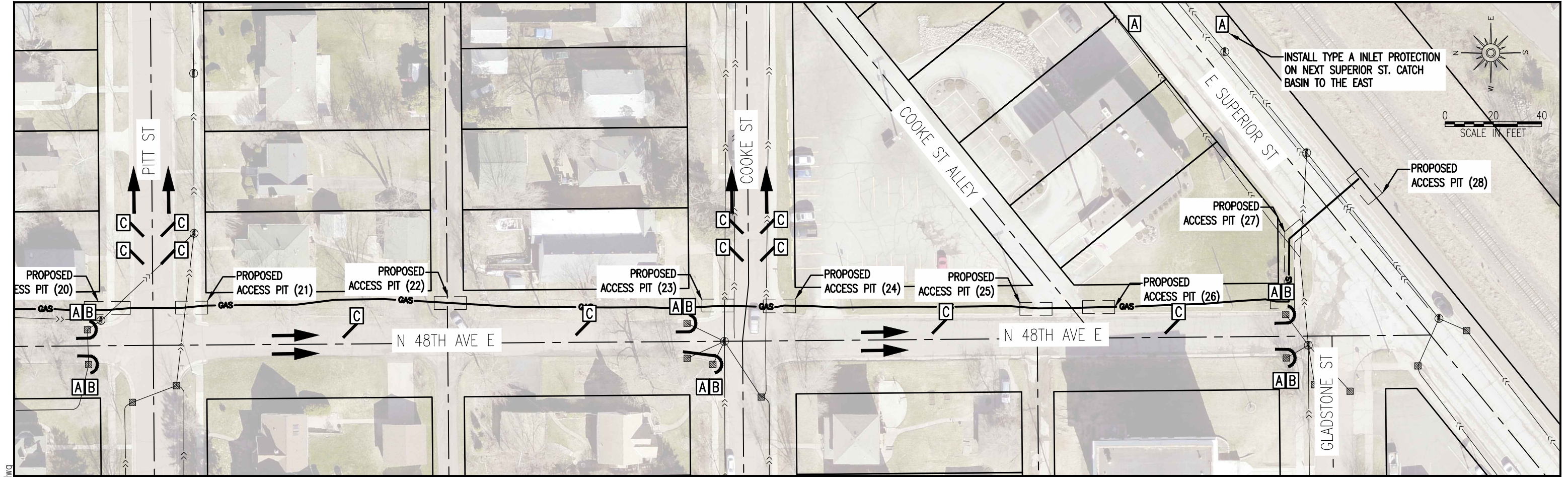
CITY PROJECT NO.: 1532

STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

48TH EROSION CONTROL 2

SHEET NO. 14 OF 54



NOTE: SEE SHEET 6 FOR DETAILS OF THE FOLLOWING EROSION CONTROL PRACTICES
TYPE A - INLET PROTECTION
TYPE B - SANDBAG DIVERSION
TYPE C - GUTTER LINE ROCK CHECKS
← FLOW DIRECTION

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2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.: 1532

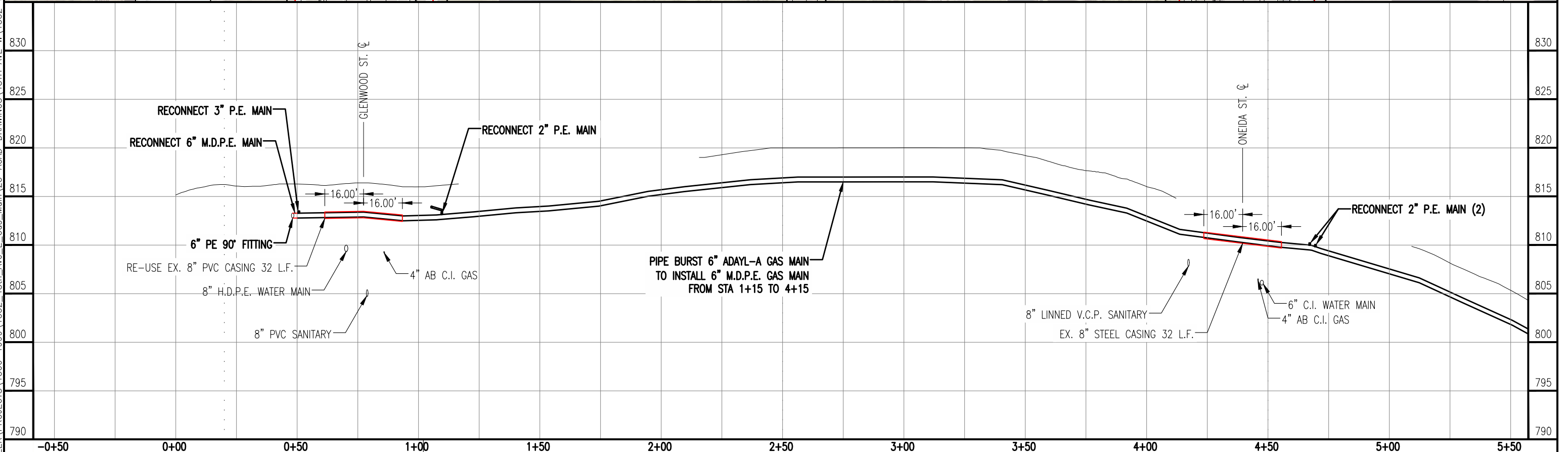
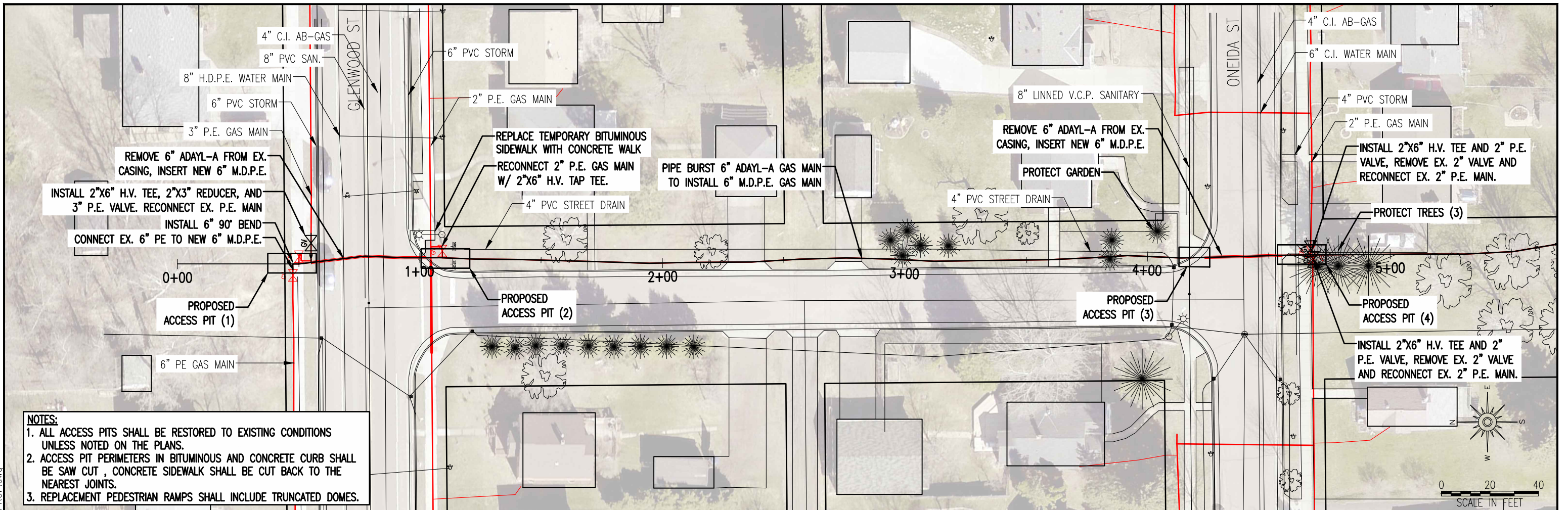
STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

48TH EROSION CONTROL 3

SHEET NO. 15 OF 54

I:\PW\ENGINEER\PROJECTS\1500-1999\1532-48th Ave. E. Gas Main\23-ACAD-DRAWINGS\48TH AVE W\1532-PROP.dwg



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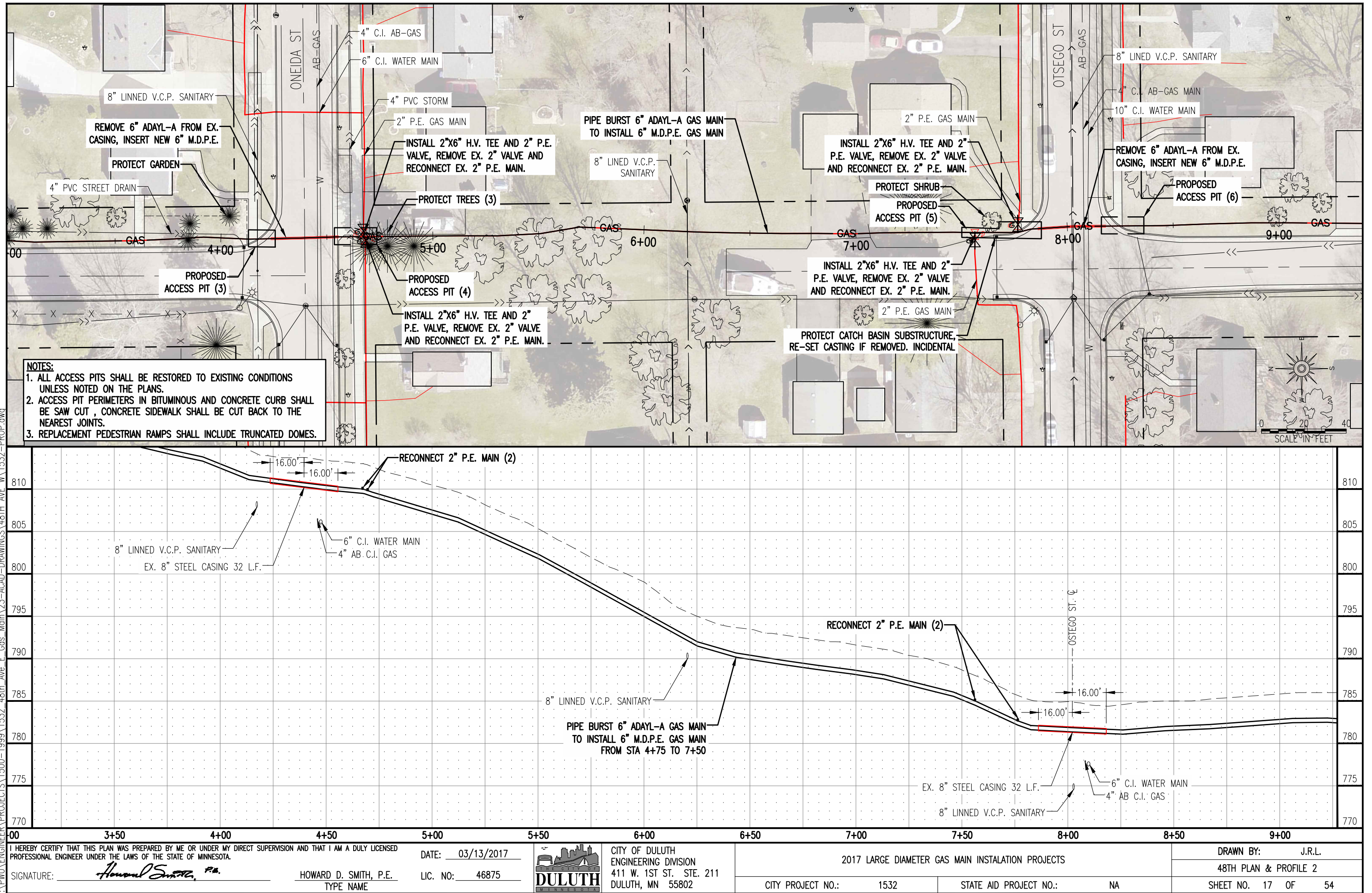
STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

48TH PLAN & PROFILE 1

SHEET NO. 16 OF 54

I:\PW\ENGINEERING\PROJECTS\1500-1999\1532-48th Ave. E. Gas Main\23-ACAD-DRAWINGS\48TH AVE W\1532-PROP.dwg



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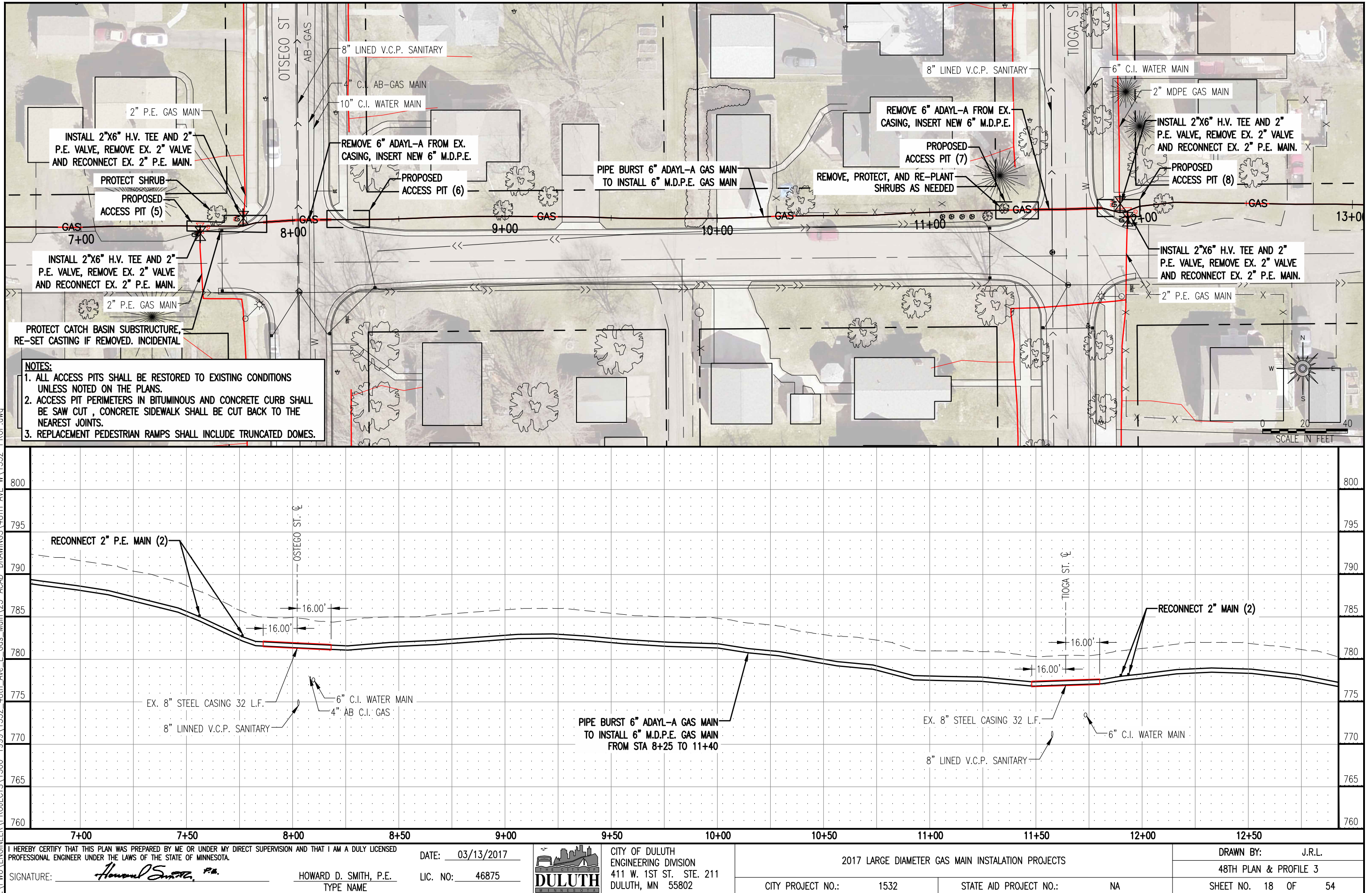
STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

48TH PLAN & PROFILE 2

SHEET NO. 17 OF 54

I:\PW\ENGINEER\PROJECTS\1500-1999\1532-48th Ave. E. Gas Main\23-ACAD-DRAWINGS\48TH AVE W\1532-PROP.dwg



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: *Howard D. Smith, P.E.*

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO: 46875



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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

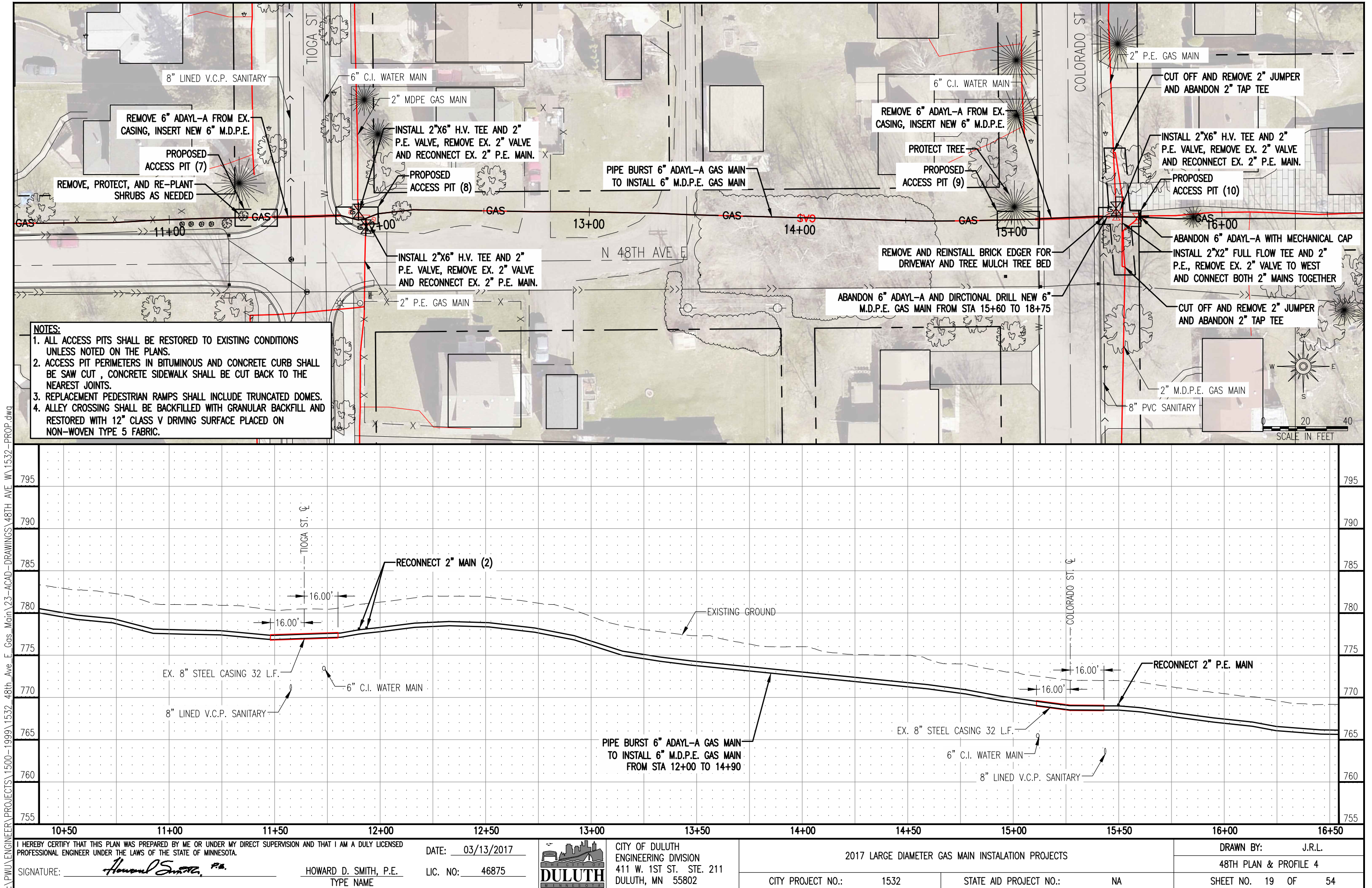
CITY PROJECT NO.: 1532

STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

48TH PLAN & PROFILE 3

SHEET NO. 18 OF 54



I:\P\W\ENGINEER\PROJECTS\1500-1999\1532-48th Ave. E. Gas Main\23-ACAD-DRAWINGS\48TH AVE W\1532-PROP.dwg

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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HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO: 46875



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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.: 1532

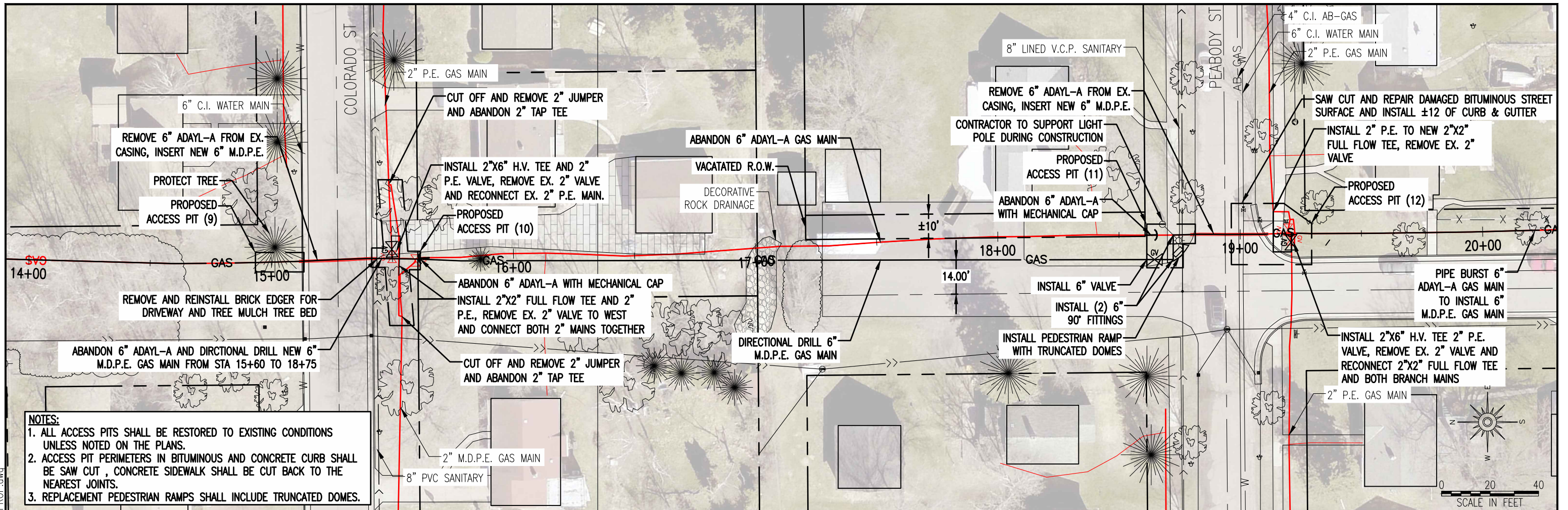
STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

48TH PLAN & PROFILE 4

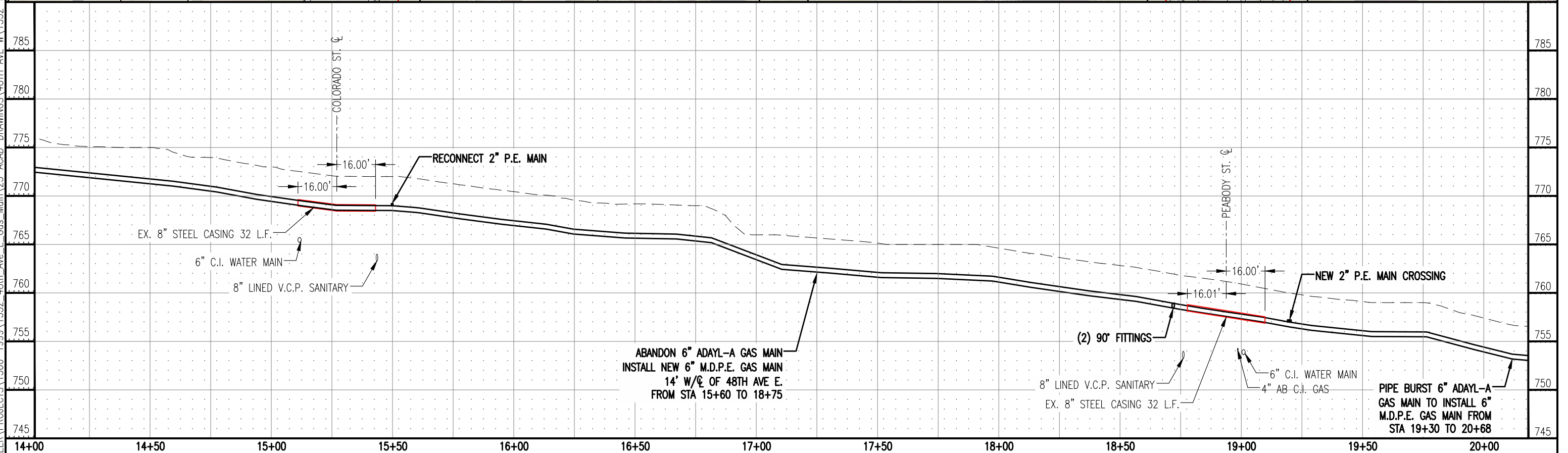
SHEET NO. 19 OF 54

\\P\ENR\PROJECTS\1500-1999\1532-48th Ave. E. Gas Main\23-ACAD-DRAWINGS\48TH AVE W\1532-PROP.dwg



NOTES:

1. ALL ACCESS PITS SHALL BE RESTORED TO EXISTING CONDITIONS UNLESS NOTED ON THE PLANS.
2. ACCESS PIT PERIMETERS IN BITUMINOUS AND CONCRETE CURB SHALL BE SAW CUT, CONCRETE SIDEWALK SHALL BE CUT BACK TO THE NEAREST JOINTS.
3. REPLACEMENT PEDESTRIAN RAMPS SHALL INCLUDE TRUNCATED DOMES.



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:

Howard D. Smith, P.E.

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO: 46875



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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

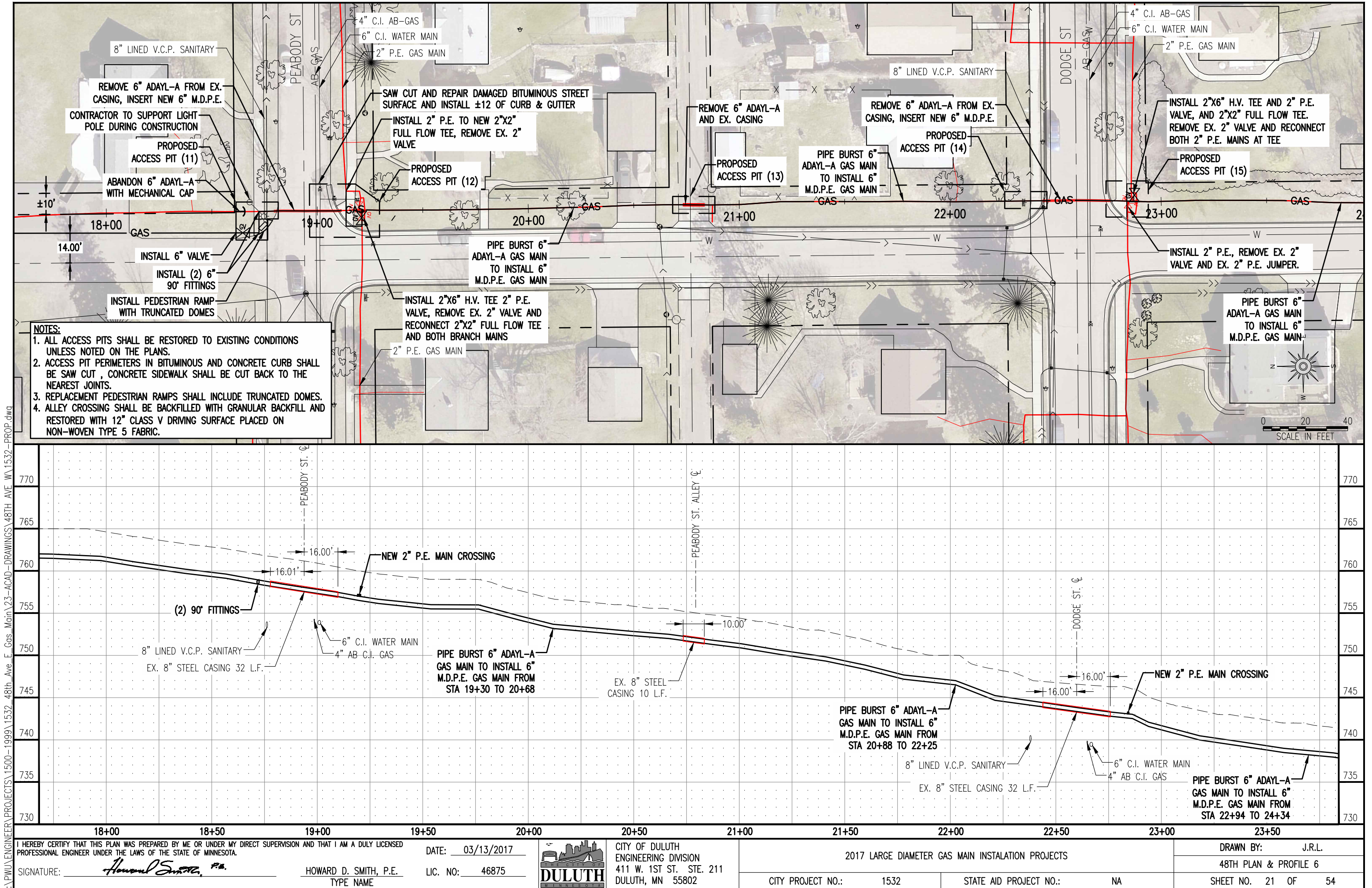
CITY PROJECT NO.: 1532

STATE AID PROJECT NO.: NA

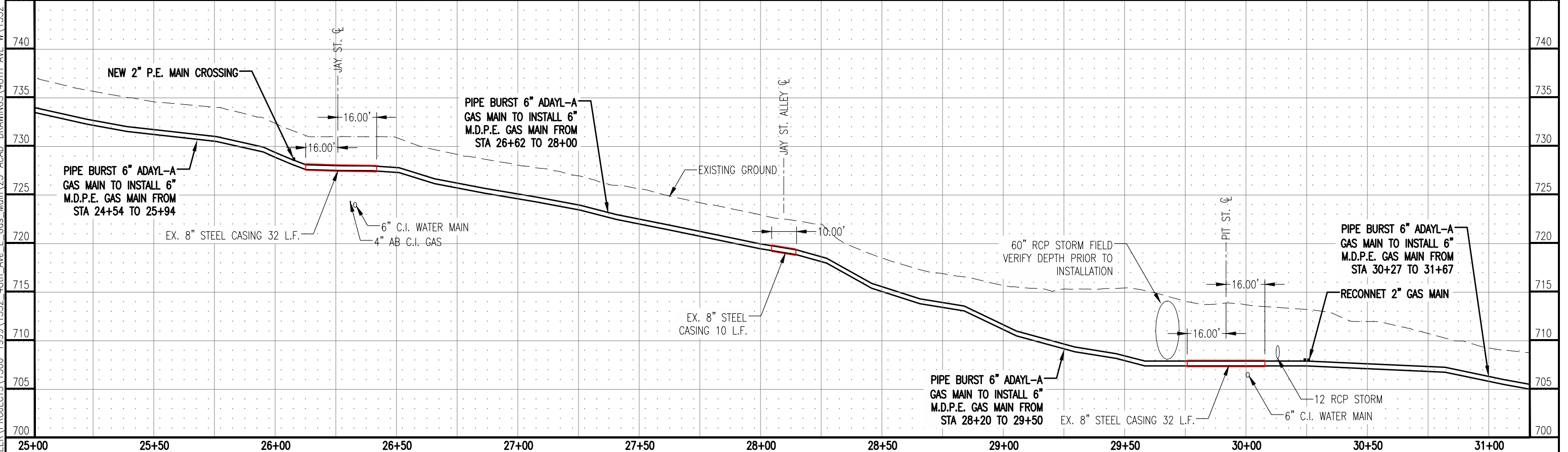
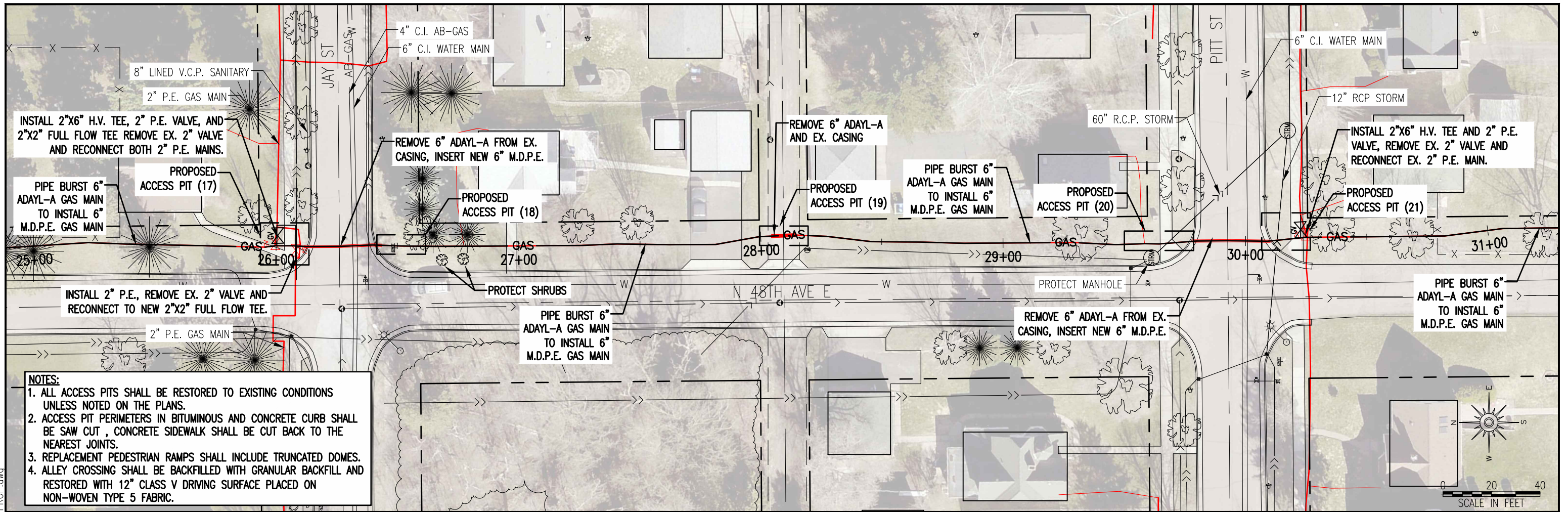
DRAWN BY: J.R.L.

48TH PLAN & PROFILE 5

SHEET NO. 20 OF 54



I:\PW\ENGINEERING\PROJECTS\1500-1999\1532-48th Ave. E. Gas Main\23-ACAD-DRAWINGS\48TH AVE W\1532-PROP.dwg



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: Howard D. Smith, P.E.

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO: 46875



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

2017 LARGE DIAMETER GAS MAIN INSTALLATION PROJECTS

CITY PROJECT NO.: 1532

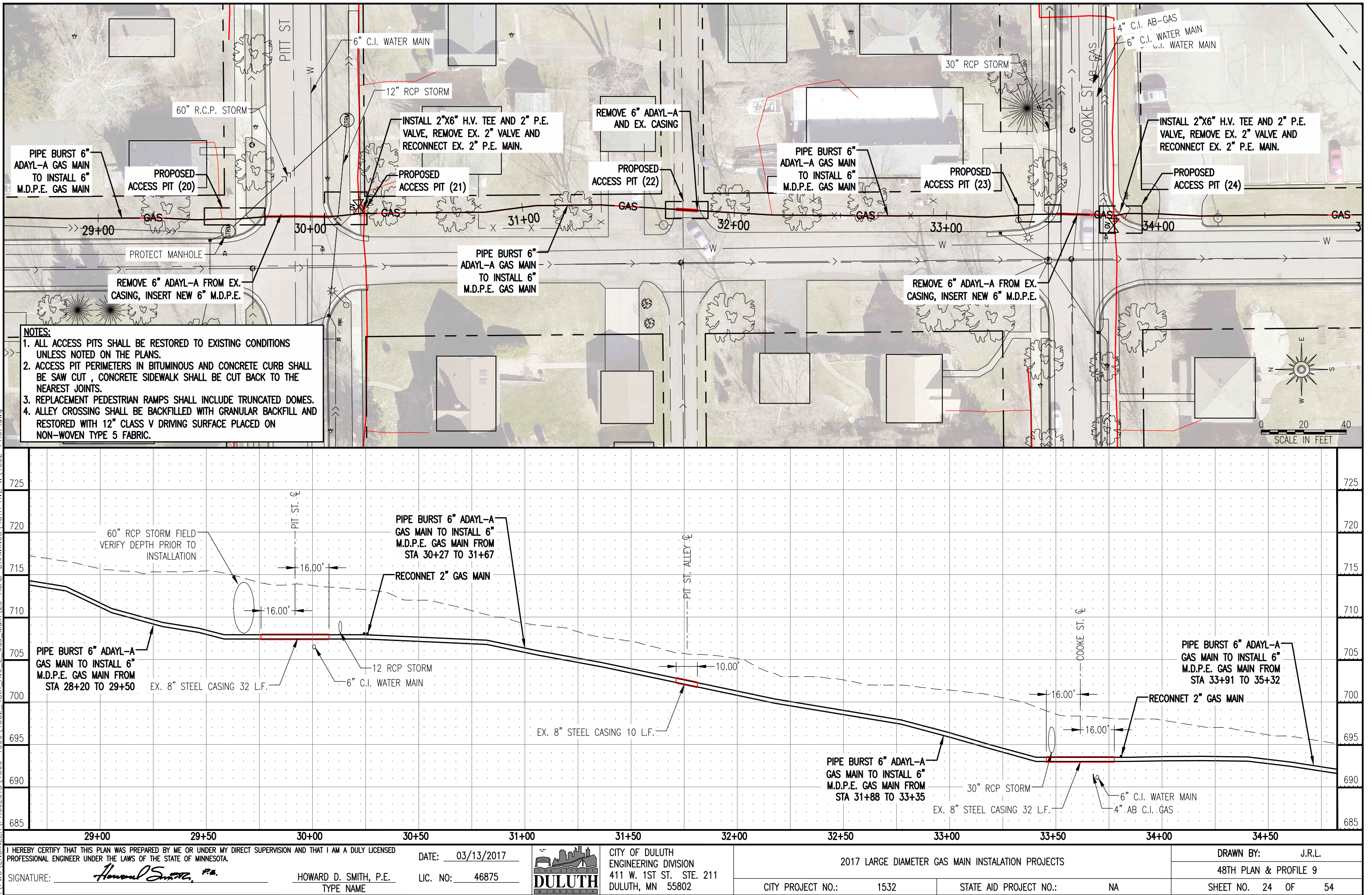
STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

48TH PLAN & PROFILE 8

SHEET NO. 23 OF 54

\\P\U\ENGINEER\PROJECTS\1500-1999\1532-48th Ave. E. Gas Main\23-ACAD-DRAWINGS\48TH AVE W\1532-PROP.dwg



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: *Howard D. Smith, P.E.*

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO: 46875



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

2017 LARGE DIAMETER GAS MAIN INSTALLATION PROJECTS

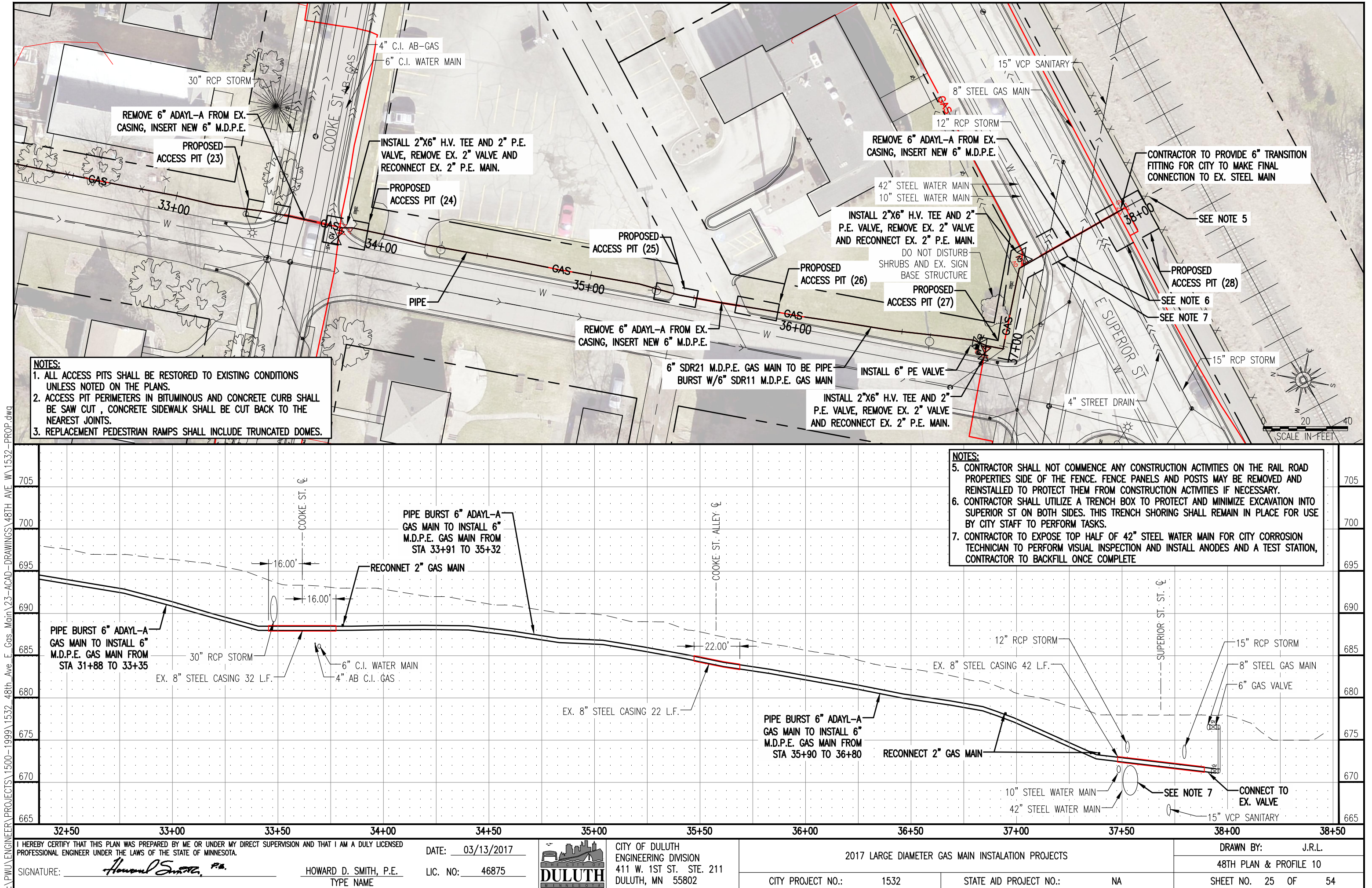
CITY PROJECT NO.: 1532

STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

48TH PLAN & PROFILE 9

SHEET NO. 24 OF 54



I:\PW\ENGINEER\PROJECTS\1500-1999\1532-48th Ave. E. Gas Main\23-ACAD-DRAWINGS\48TH AVE W\1532-PROP.dwg

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: Howard D. Smith, P.E.

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

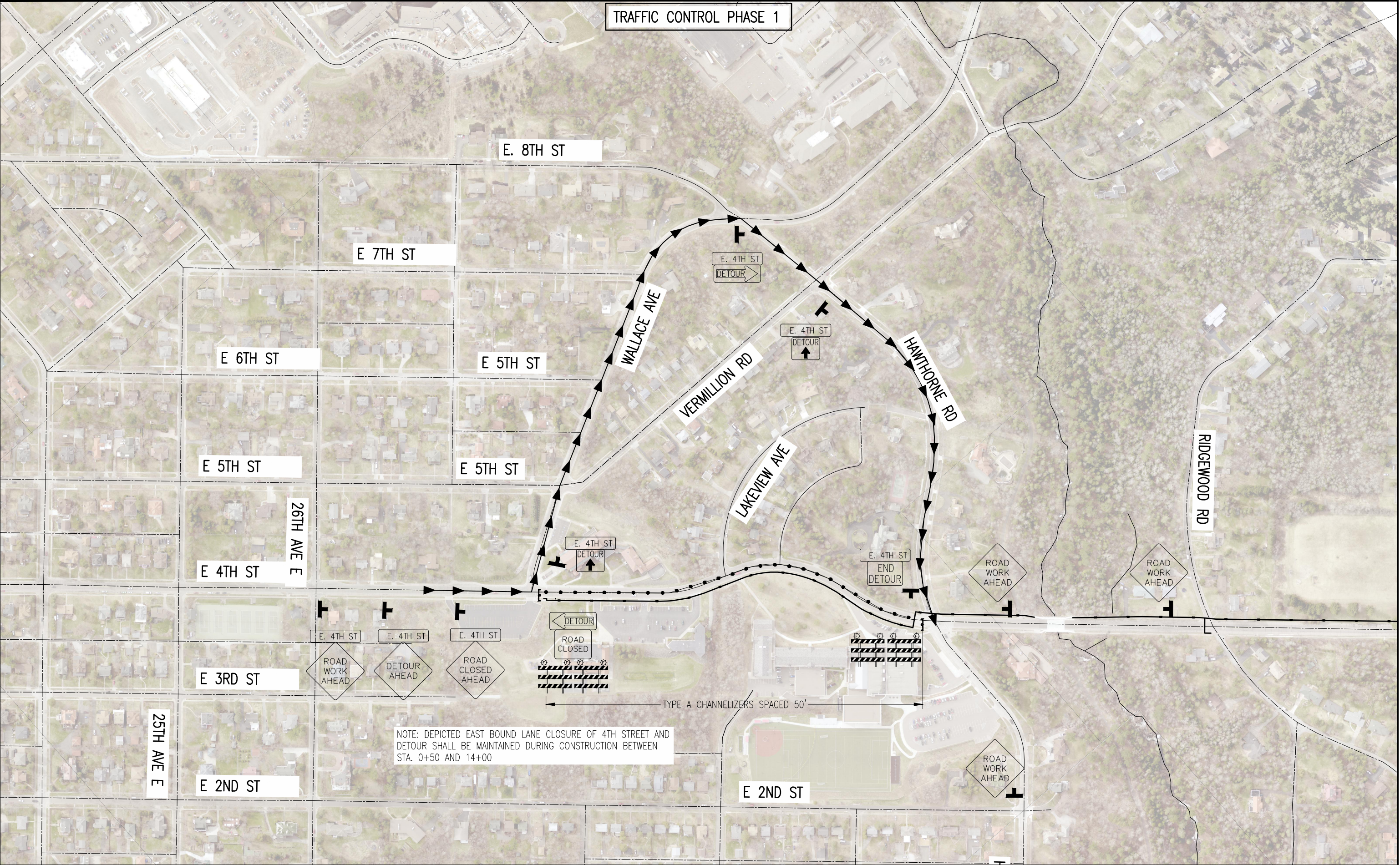
LIC. NO: 46875



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

2017 LARGE DIAMETER GAS MAIN INSTALLATION PROJECTS		DRAWN BY: J.R.L.	
CITY PROJECT NO.: 1532		STATE AID PROJECT NO.: NA	
SHEET NO. 25		OF 54	

I:\PW\ENGINEER\PROJECTS\1500-1999\1532-48th Ave E Gas Main\23-ACAD-DRAWINGS\4TH ST WALLACE TO 34TH\1532-4TH ST-TRAF.dwg



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: Howard D. Smith, P.E.

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO.: 46875



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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.: 1532

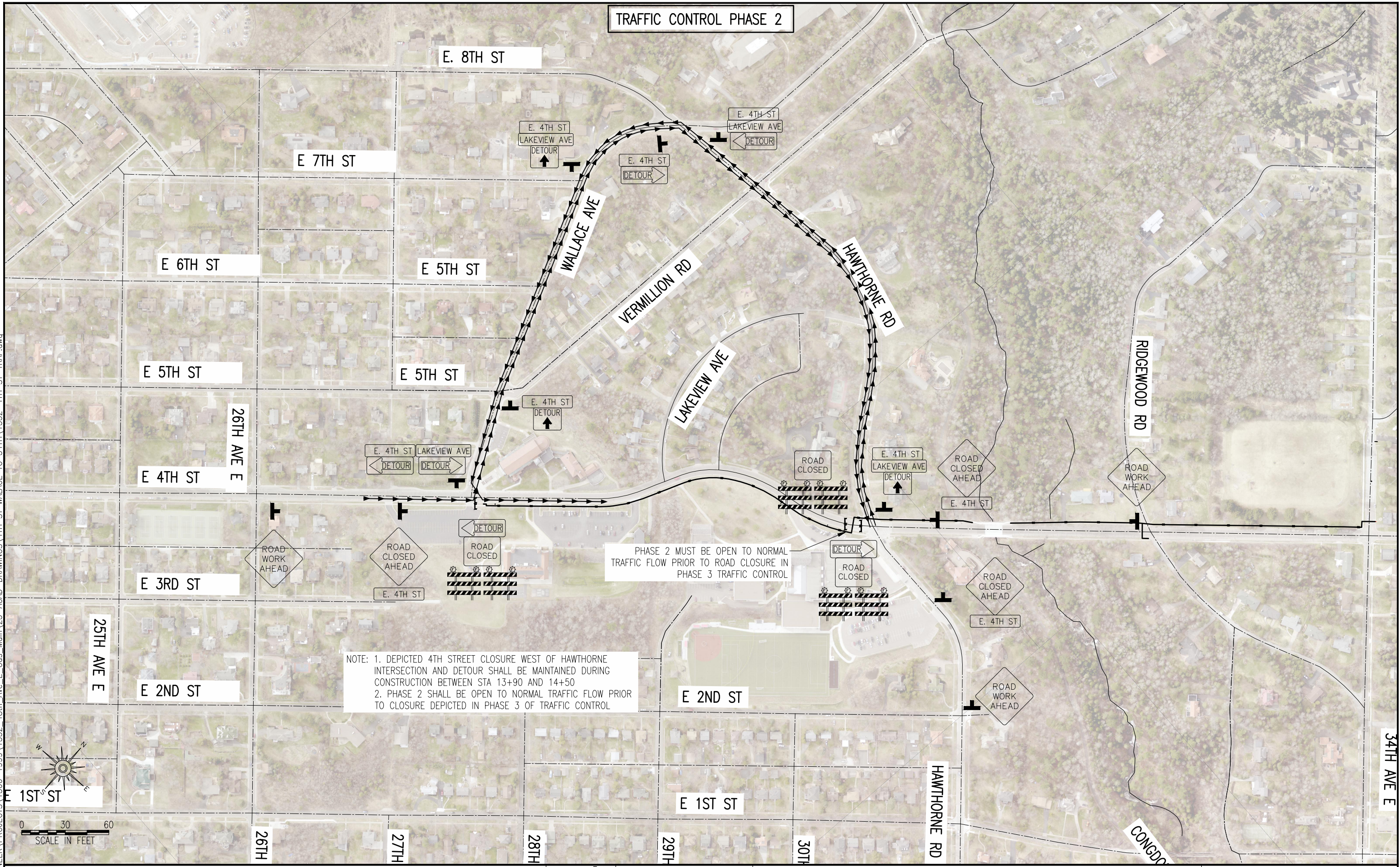
STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

4TH ST TRAFFIC CONTROL 1

SHEET NO. 26 OF 54

I:\PWU\ENGINEER\PROJECTS\1500-1999\1532-48th Ave E Gas Main\23-ACAD-DRAWINGS\4TH ST WALLACE TO 34TH\1532-4TH ST-TRAF.dwg



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SIGNATURE: *Howard D. Smith, P.E.*

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO: 46875



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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.: 1532

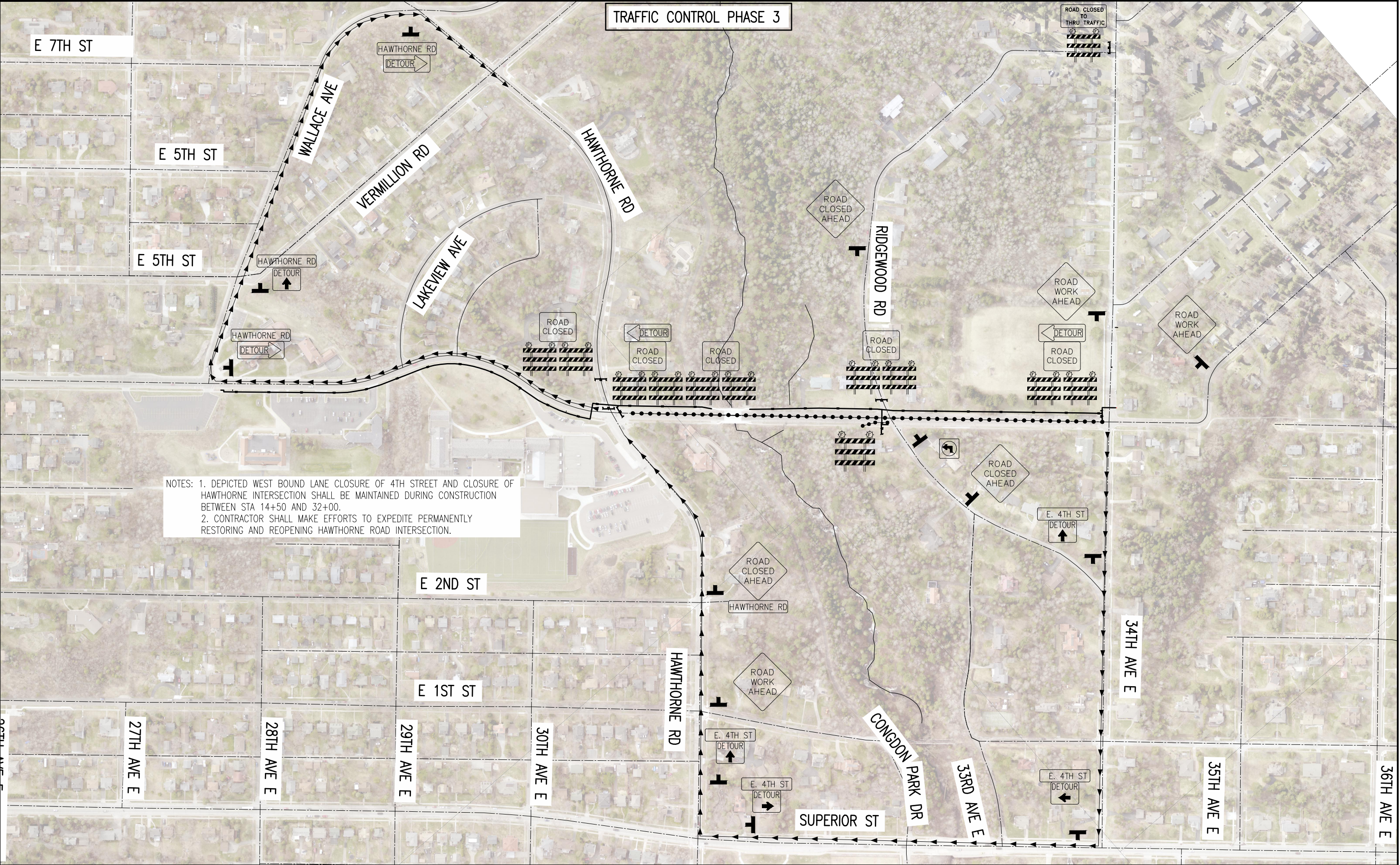
STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

4TH ST. TRAFFIC CONTROL 2

SHEET NO. 27 OF 54

I:\PWU\ENGINEER\PROJECTS\1500-1999\1532-48th Ave E Gas Main\23-ACAD-DRAWINGS\4TH ST WALLACE TO 34TH\1532-4TH ST-TRAF.dwg



NOTES: 1. DEPICTED WEST BOUND LANE CLOSURE OF 4TH STREET AND CLOSURE OF HAWTHORNE INTERSECTION SHALL BE MAINTAINED DURING CONSTRUCTION BETWEEN STA 14+50 AND 32+00.
2. CONTRACTOR SHALL MAKE EFFORTS TO EXPEDITE PERMANENTLY RESTORING AND REOPENING HAWTHORNE ROAD INTERSECTION.

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: *Howard D. Smith, P.E.*

HOWARD D. SMITH, P.E.
TYPE NAME

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

2017 LARGE DIAMETER GAS MAIN INSTALLATION PROJECTS

CITY PROJECT NO.: 1532

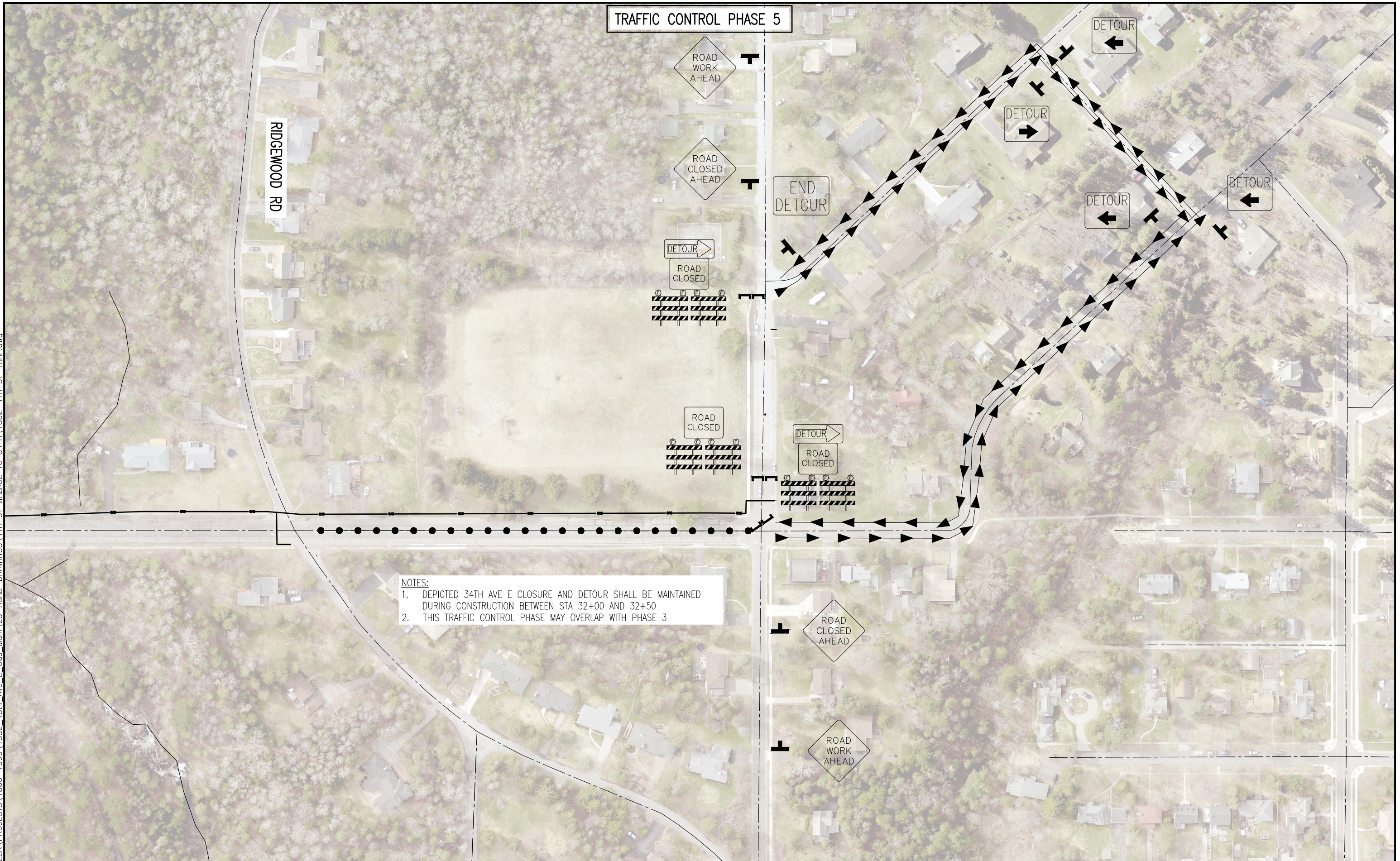
STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

4TH ST. TRAFFIC CONTROL 3

SHEET NO. 28 OF 54

I:\PW\ENGINEER\PROJECTS\1500-1999-1532-48th Ave E Gas Main\23-ACAD-DRAWINGS\4TH ST WALACE TO 34TH\1532-4TH ST-TRAF.dwg



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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.: 1532

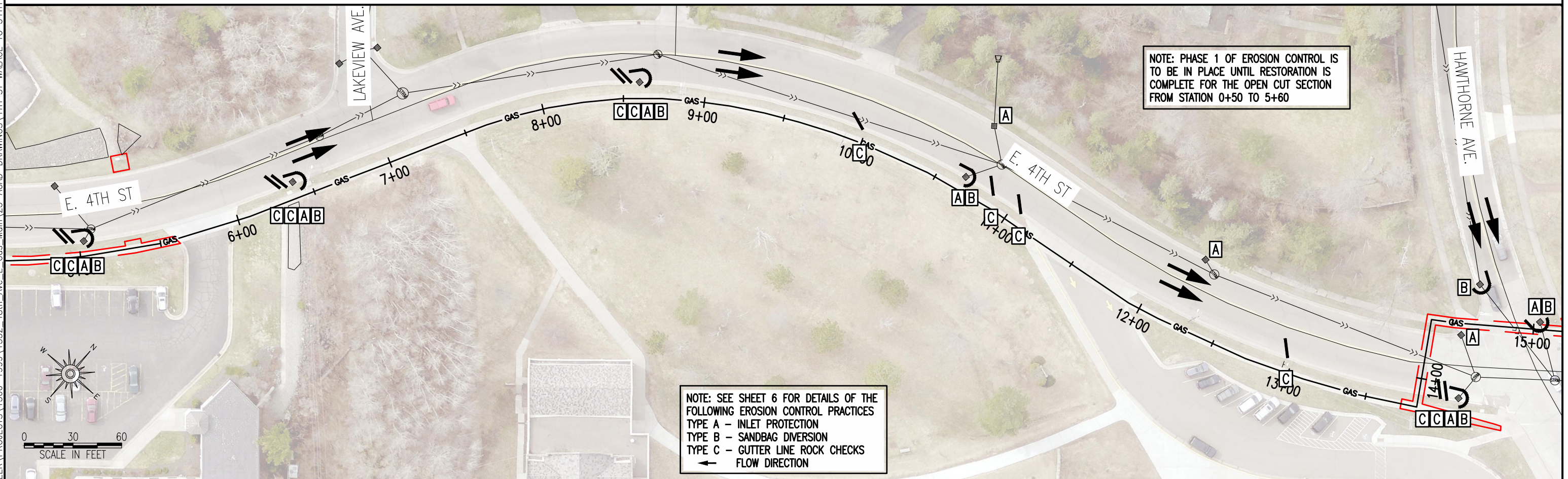
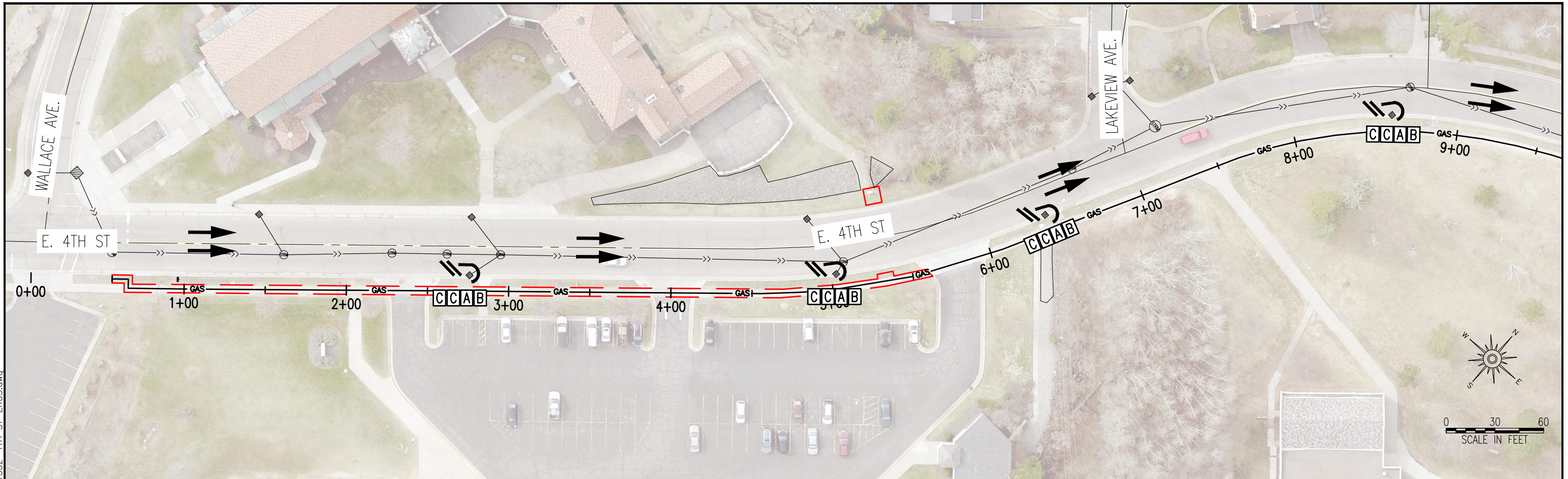
STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

4TH ST. TRAFFIC CONTROL 4

SHEET NO. 29 OF 54

I:\PW\ENGINEER\PROJECTS\1500-1999\1532-48th Ave E Gas Main\23-ACAD-DRAWINGS\4TH ST WALLACE TO 34TH\1532-4TH ST-EROS.dwg



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SIGNATURE: *Howard D. Smith, P.E.*

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

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

2017 LARGE DIAMETER GAS MAIN INSTALLATION PROJECTS

CITY PROJECT NO.: 1532

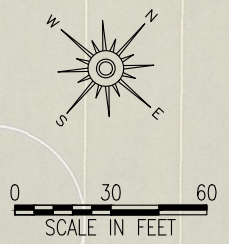
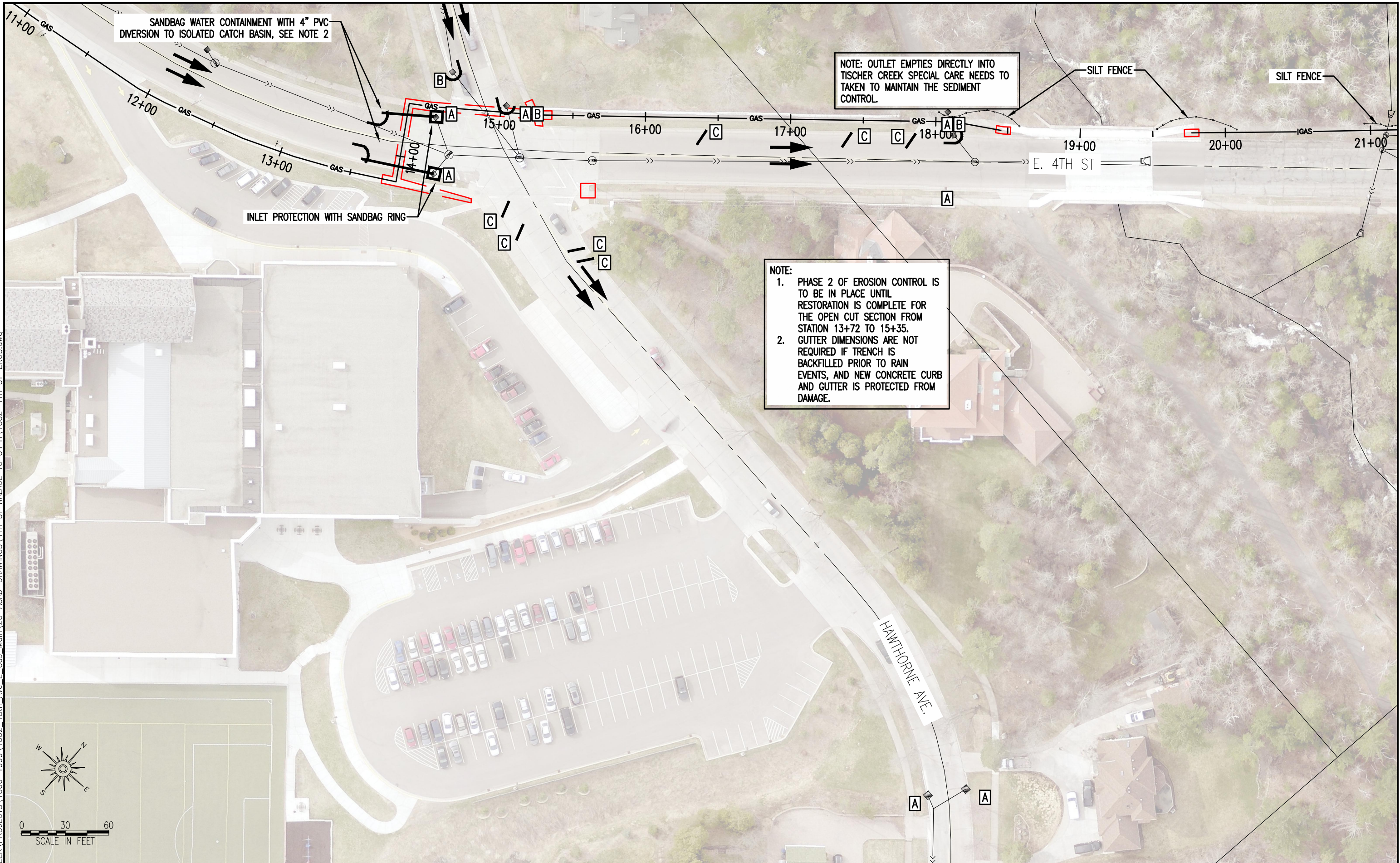
STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

4TH ST EROS 1

SHEET NO. 30 OF 54

I:\PW\ENGINEER\PROJECTS\1500-1999\1532-48th Ave E Gas Main\23-ACAD-DRAWINGS\4TH ST WALACE TO 34TH\1532-4TH ST-EROS.dwg



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: *Howard D. Smith, P.E.*

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO: 46875



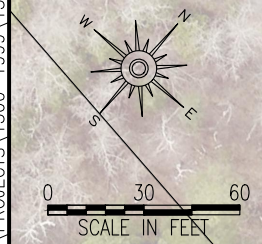
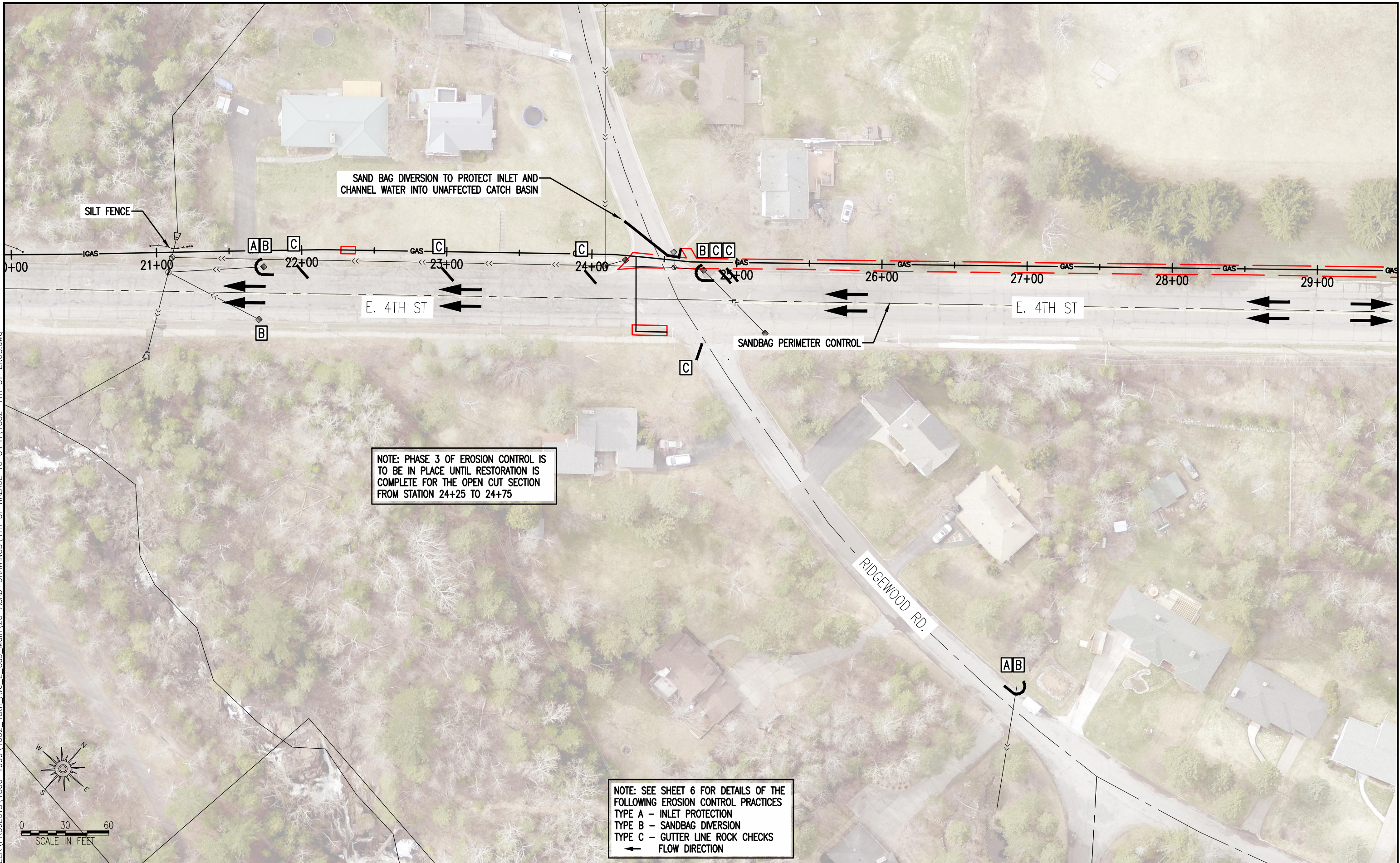
CITY OF DULUTH
ENGINEERING DIVISION
411 W. 1ST ST. STE. 211
DULUTH, MN 55802

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.:	1532	STATE AID PROJECT NO.:	NA
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DRAWN BY:	J.R.L.
4TH ST EROS 2	
SHEET NO.	31 OF 54

I:\PW\ENGINEER\PROJECTS\1500-1999-1532-48th Ave E Gas Main\23-ACAD-DRAWINGS\4TH ST WALACE TO 34TH\1532-4TH ST-EROS.dwg



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SIGNATURE: *Howard D. Smith, P.E.*

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO: 46875



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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.: 1532

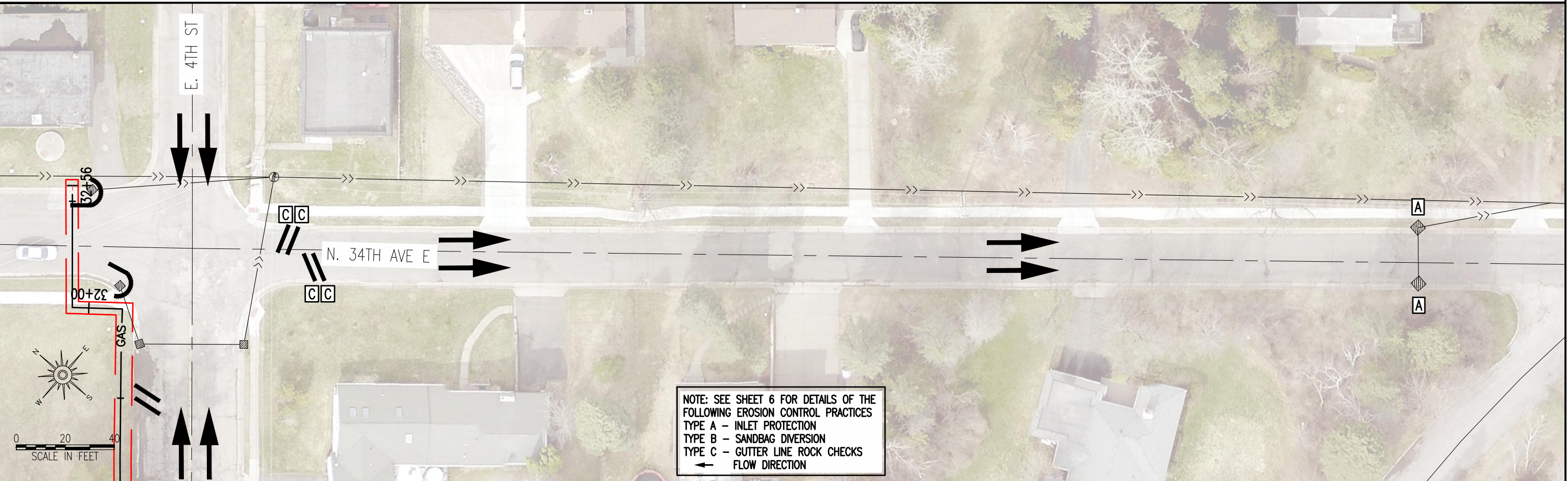
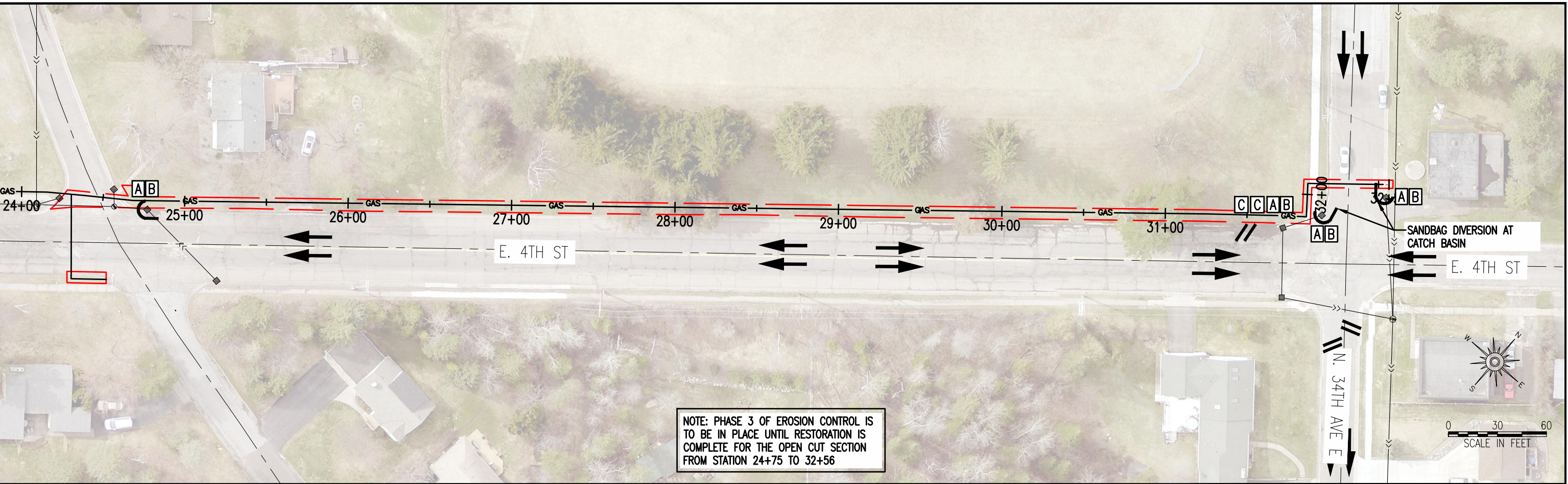
STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

4TH ST EROS 3

SHEET NO. 32 OF 54

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DATE: 03/13/2017

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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.: 1532

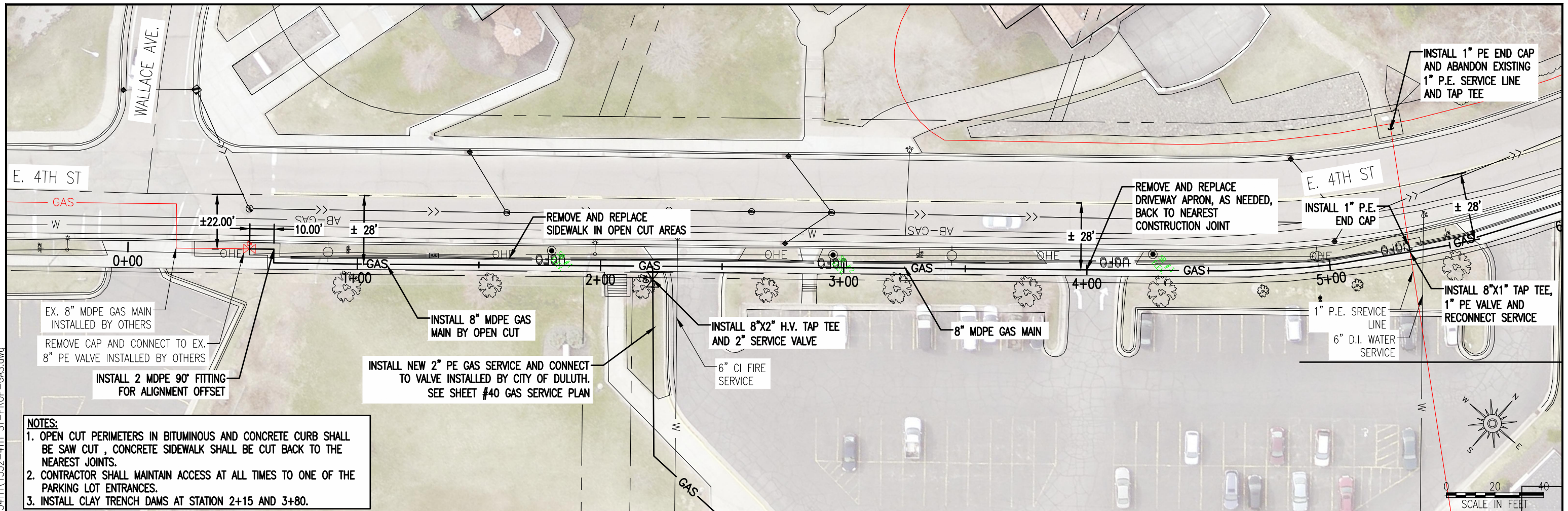
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DRAWN BY: J.R.L.

4TH ST EROS 4

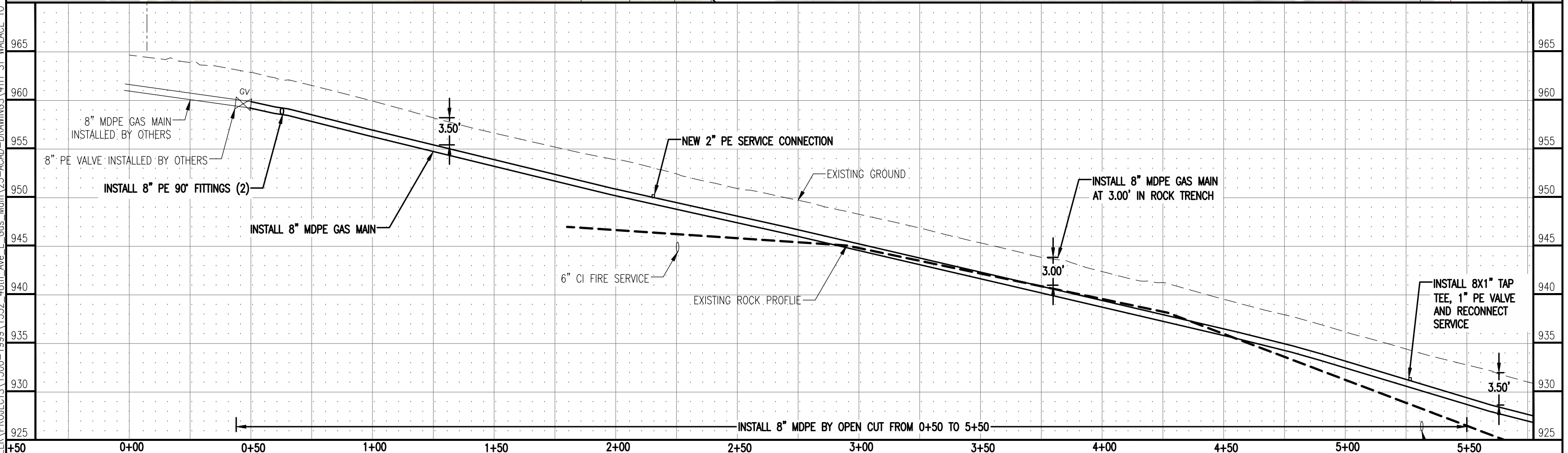
SHEET NO. 33 OF 54

I:\PW\ENGINE\PROJECTS\1500-1999\1532-48th Ave E Gas Main\23-ACAD-DRAWINGS\4TH ST WALLACE TO 34TH\1532-4TH ST-PROP-GAS.dwg



NOTES:

1. OPEN CUT PERIMETERS IN BITUMINOUS AND CONCRETE CURB SHALL BE SAW CUT, CONCRETE SIDEWALK SHALL BE CUT BACK TO THE NEAREST JOINTS.
2. CONTRACTOR SHALL MAINTAIN ACCESS AT ALL TIMES TO ONE OF THE PARKING LOT ENTRANCES.
3. INSTALL CLAY TRENCH DAMS AT STATION 2+15 AND 3+80.



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: *Howard D. Smith, P.E.*

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

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

2017 LARGE DIAMETER GAS MAIN INSTALLATION PROJECTS

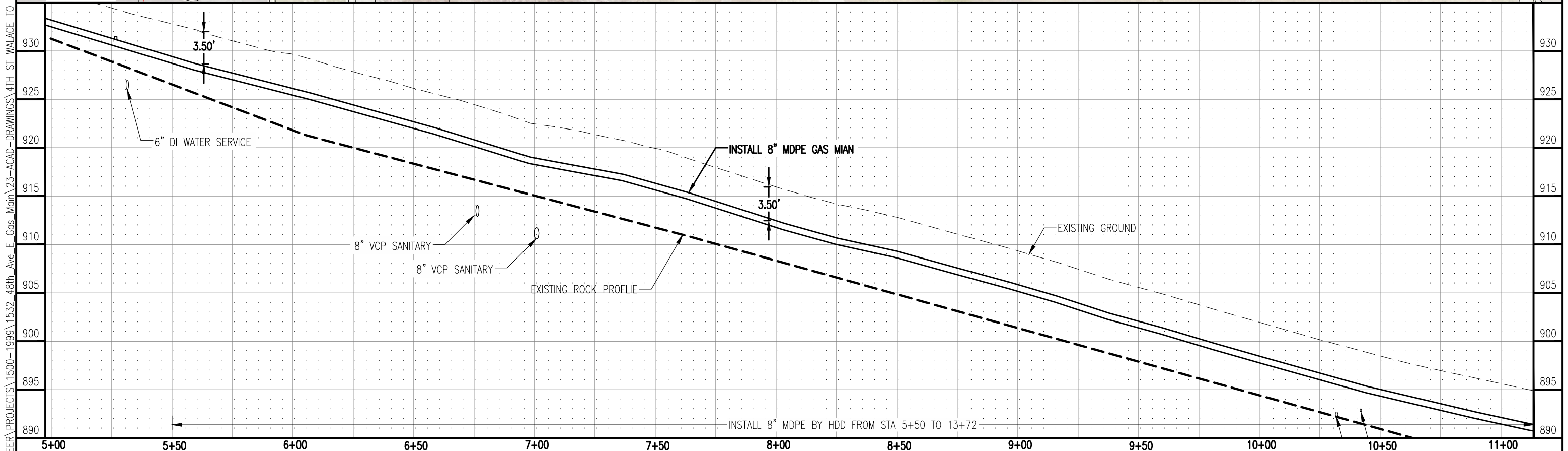
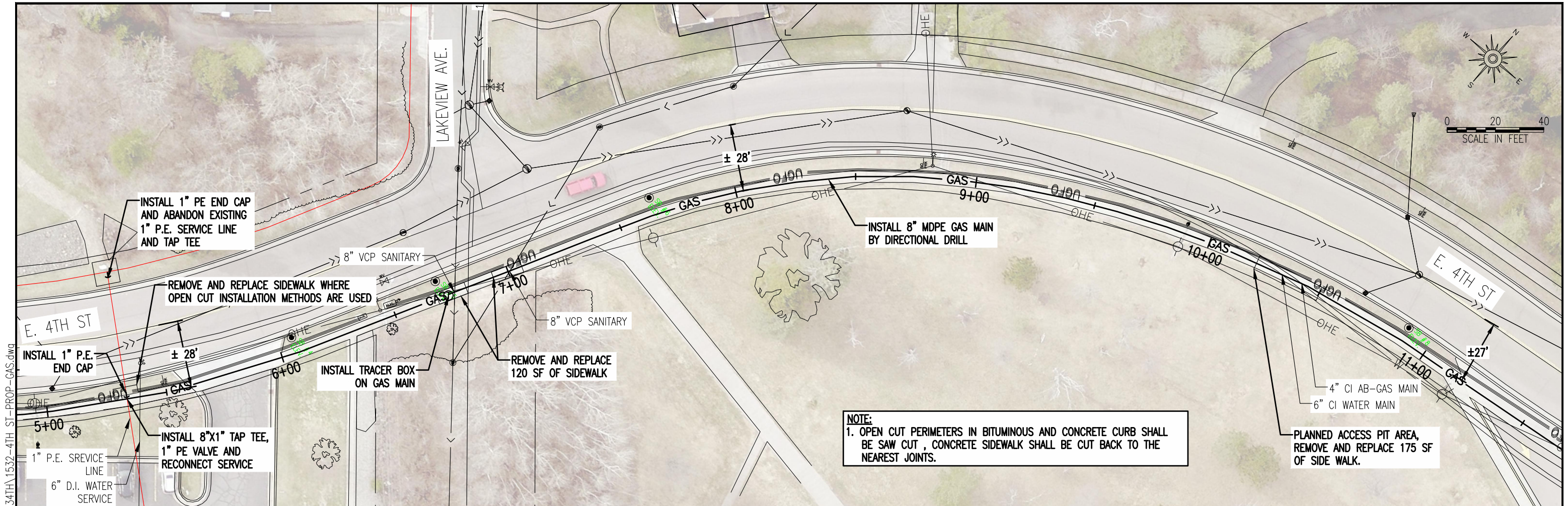
CITY PROJECT NO.: 1532

STATE AID PROJECT NO.: NA

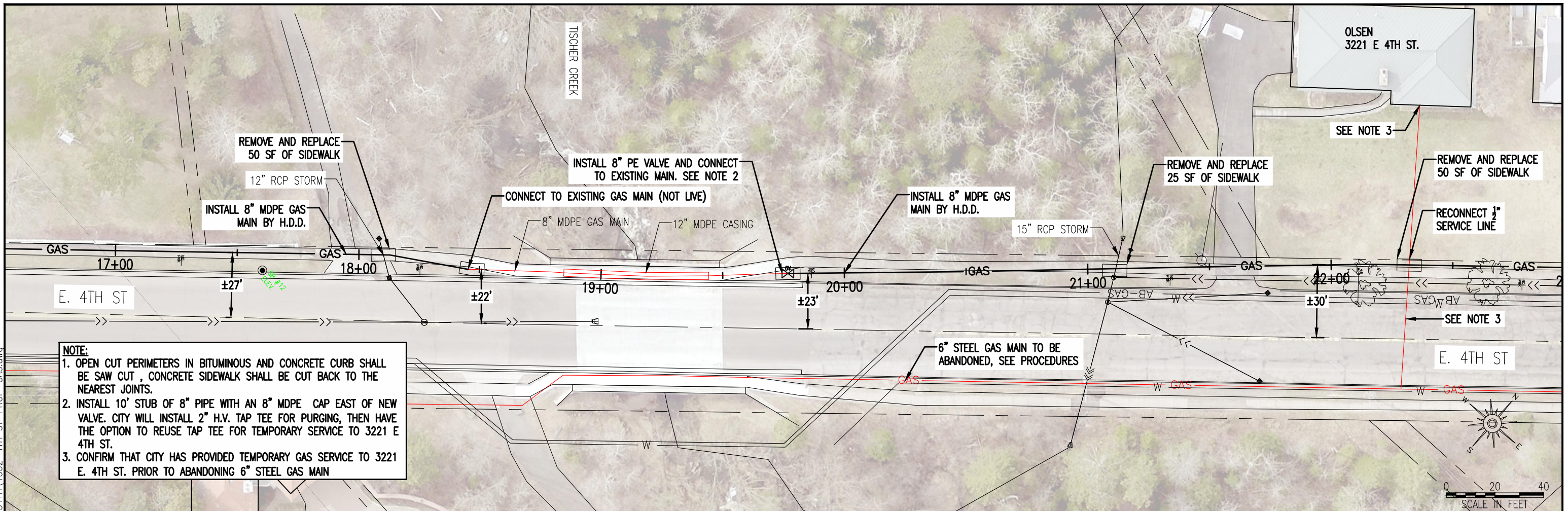
DRAWN BY: J.R.L.

4TH ST. PLAN & PROFILE 1

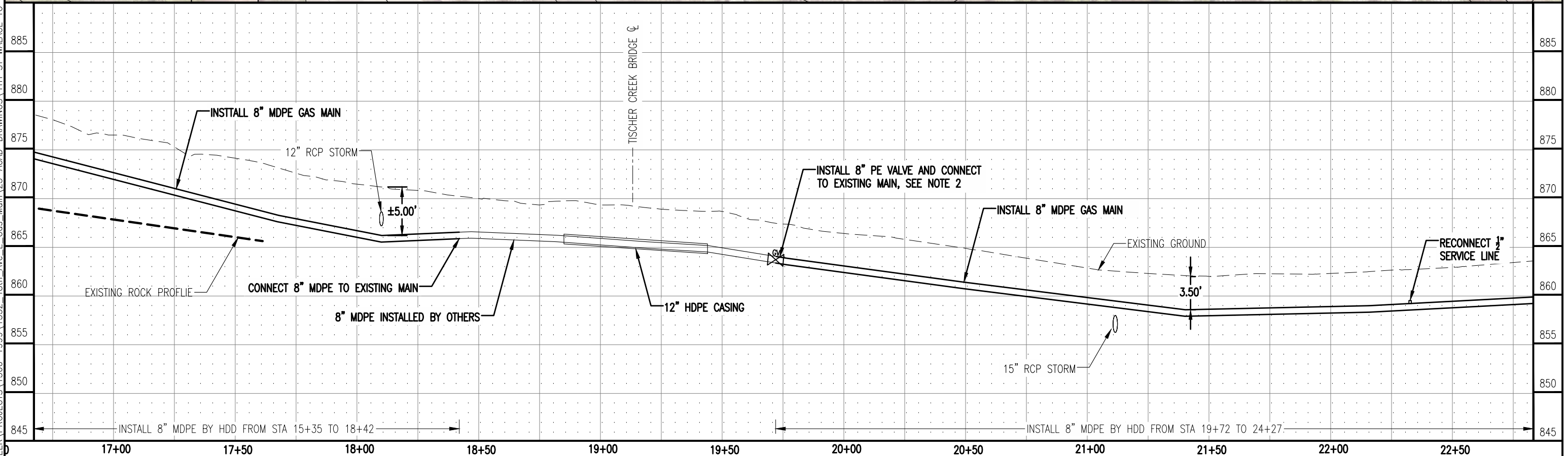
SHEET NO. 34 OF 54



I:\PW\ENGINEER\PROJECTS\1500-1999\1532-48th Ave E Gas Main\23-ACAD-DRAWINGS\4TH ST WALACE TO 34TH\1532-4TH ST-PROP-GAS.dwg



- NOTE:**
1. OPEN CUT PERIMETERS IN BITUMINOUS AND CONCRETE CURB SHALL BE SAW CUT , CONCRETE SIDEWALK SHALL BE CUT BACK TO THE NEAREST JOINTS.
 2. INSTALL 10' STUB OF 8" PIPE WITH AN 8" MDPE CAP EAST OF NEW VALVE. CITY WILL INSTALL 2" H.V. TAP TEE FOR PURGING, THEN HAVE THE OPTION TO REUSE TAP TEE FOR TEMPORARY SERVICE TO 3221 E 4TH ST.
 3. CONFIRM THAT CITY HAS PROVIDED TEMPORARY GAS SERVICE TO 3221 E. 4TH ST. PRIOR TO ABANDONING 6" STEEL GAS MAIN



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DATE: 03/13/2017

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DULUTH, MN 55802

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

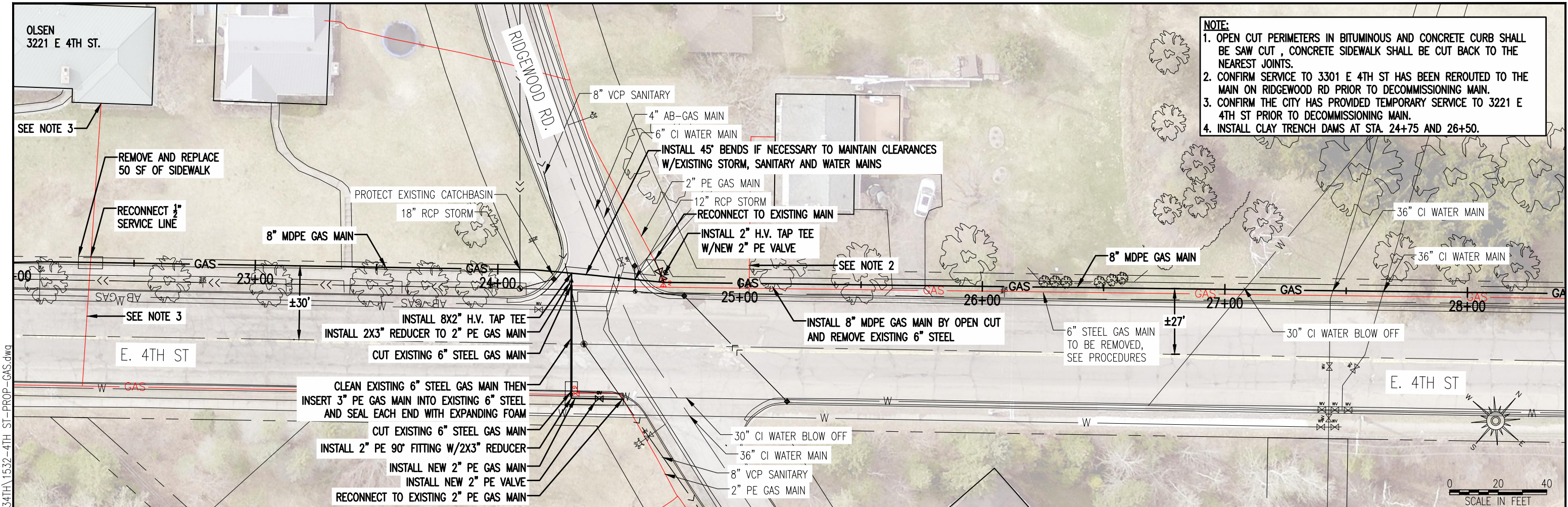
CITY PROJECT NO.: 1532

STATE AID PROJECT NO.: NA

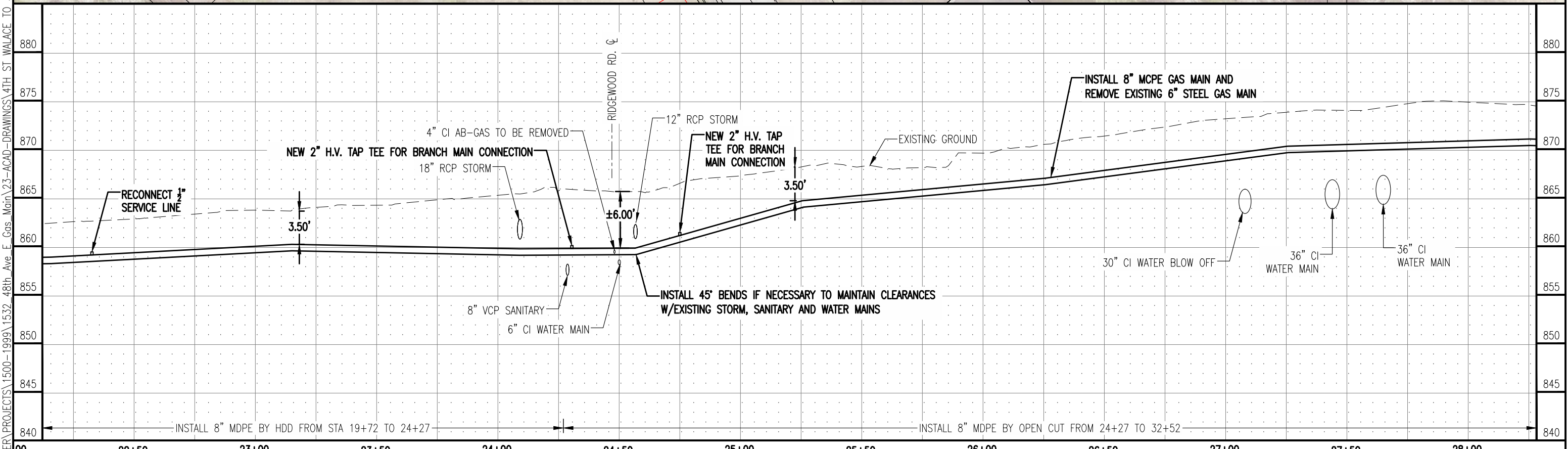
DRAWN BY: J.R.L.

4TH ST. PLAN & PROFILE 4

SHEET NO. 37 OF 54

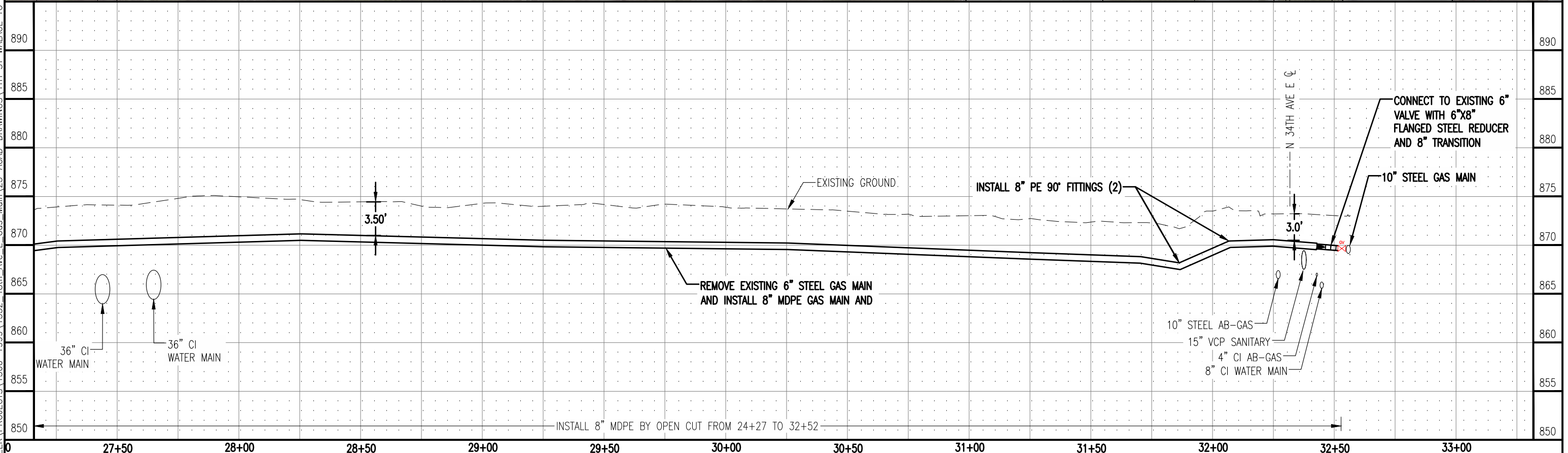
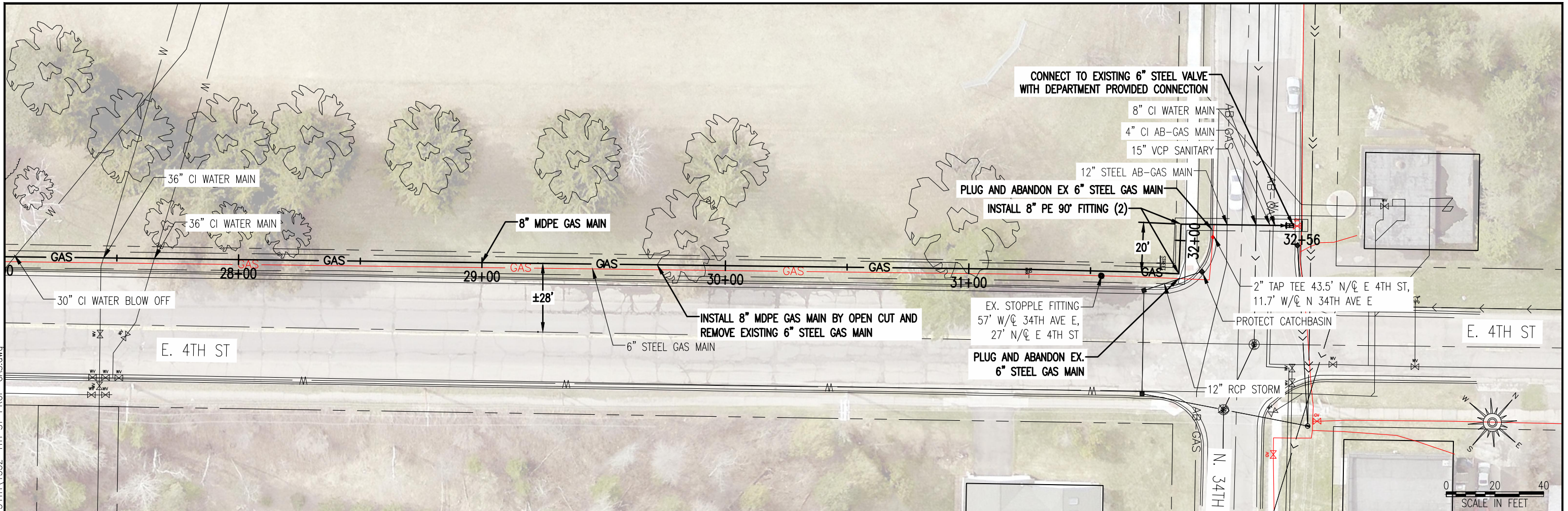


- NOTE:**
1. OPEN CUT PERIMETERS IN BITUMINOUS AND CONCRETE CURB SHALL BE SAW CUT , CONCRETE SIDEWALK SHALL BE CUT BACK TO THE NEAREST JOINTS.
 2. CONFIRM SERVICE TO 3301 E 4TH ST HAS BEEN REROUTED TO THE MAIN ON RIDGEWOOD RD PRIOR TO DECOMMISSIONING MAIN.
 3. CONFIRM THE CITY HAS PROVIDED TEMPORARY SERVICE TO 3221 E 4TH ST PRIOR TO DECOMMISSIONING MAIN.
 4. INSTALL CLAY TRENCH DAMS AT STA. 24+75 AND 26+50.



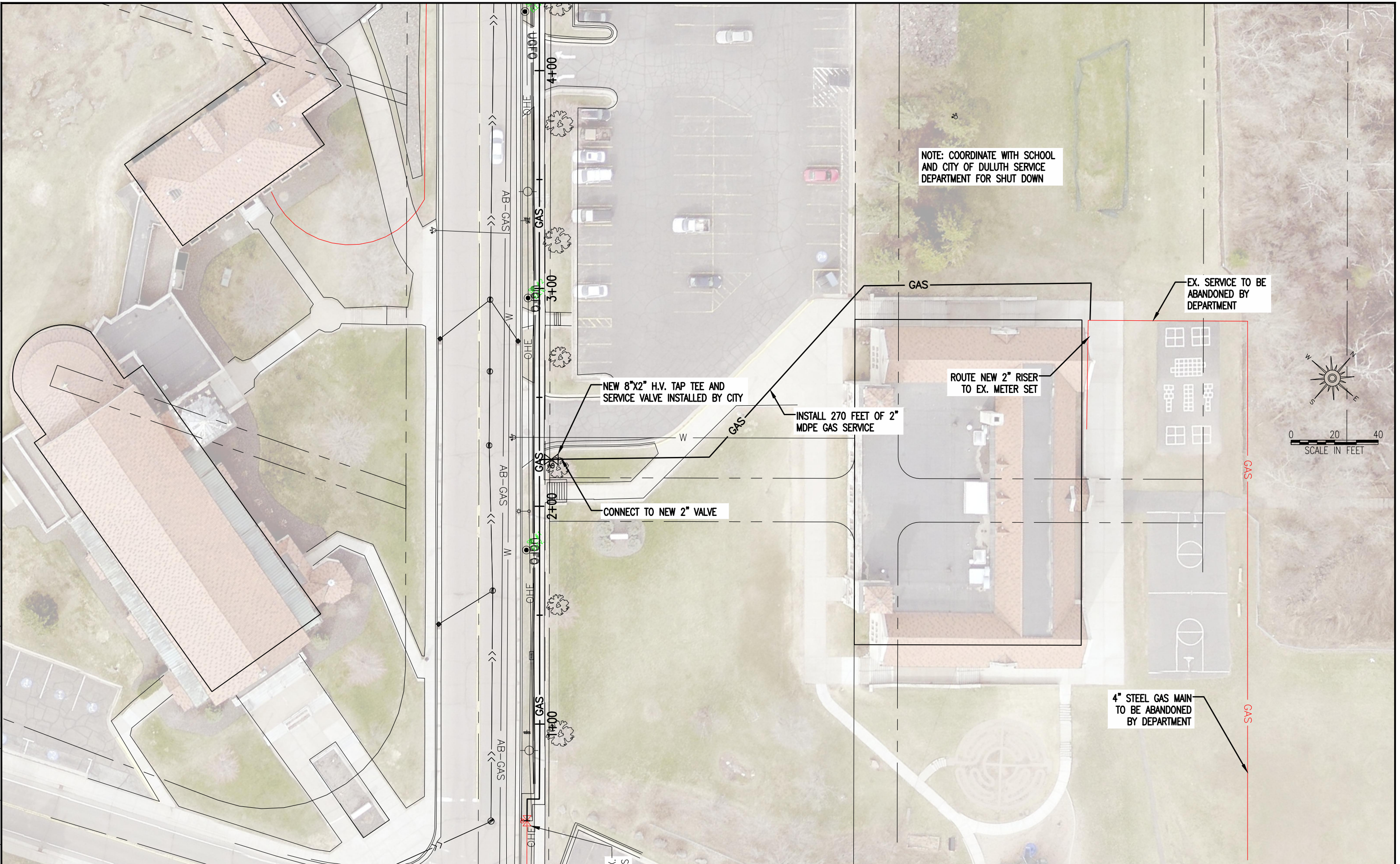
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		DATE: 03/13/2017		CITY OF DULUTH ENGINEERING DIVISION 411 W. 1ST ST. STE. 211 DULUTH, MN 55802		2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS		DRAWN BY: J.R.L.	
SIGNATURE: <i>Howard D. Smith, P.E.</i>		HOWARD D. SMITH, P.E. TYPE NAME		LIC. NO: 46875		CITY PROJECT NO.: 1532		STATE AID PROJECT NO.: NA	
				DULUTH				4TH ST. PLAN & PROFILE 5	
								SHEET NO. 38 OF 54	

I:\PW\ENGINE\PROJECTS\1500-1999\1532-48th Ave E Gas Main\23-ACAD-DRAWINGS\4TH ST WALACE TO 34TH\1532-4TH ST-PROP-GAS.dwg



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.		DATE: 03/13/2017		CITY OF DULUTH ENGINEERING DIVISION 411 W. 1ST ST. STE. 211 DULUTH, MN 55802	2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS		DRAWN BY: J.R.L.	
SIGNATURE: 		LIC. NO: 46875			CITY PROJECT NO.: 1532	STATE AID PROJECT NO.: NA	4TH ST. PLAN & PROFILE 6	

I:\PW\ENGINEER\PROJECTS\1500-1999\1532_48th_Ave_E_Gas_Main\23-ACAD-DRAWINGS\4TH_ST_WALACE TO 34TH\1532-4TH_ST-PROP-GAS.dwg



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: *Howard D. Smith, P.E.*

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO: 46875



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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

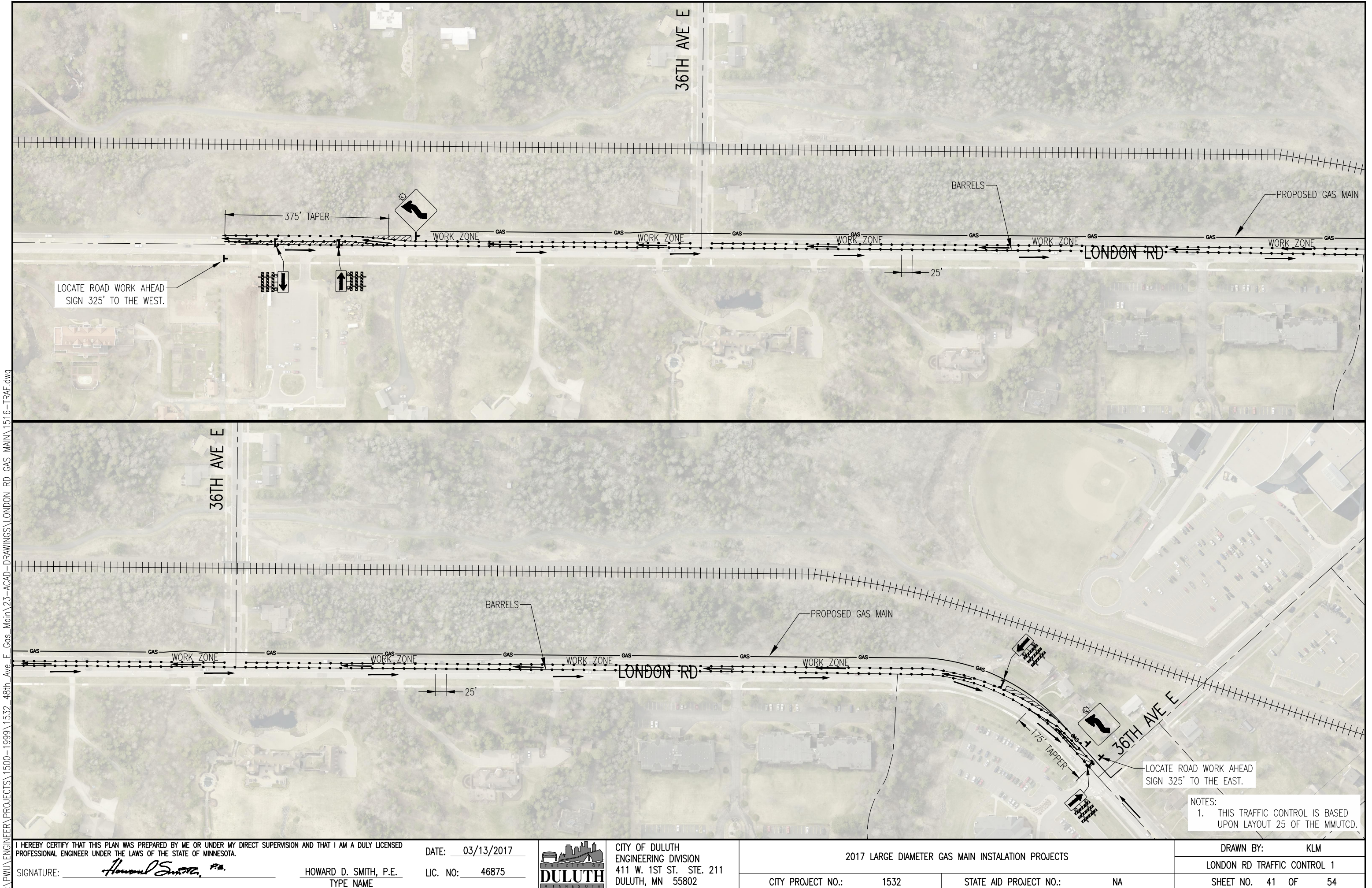
CITY PROJECT NO.: 1532

STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

4TH ST. GAS SERVICE PLAN

SHEET NO. 40 OF 54





NOTE:
1. THIS DETOUR PLAN WHILE 36TH AVE EAST IS UNDER CONSTRUCTION SHALL BE USED IN CONJUNCTION WITH LONDON ROAD LANE-SHIFT TRAFFIC CONTROL.
2. SEE LAYOUT 25 OF THE MMUTCD FOR LONDON ROAD LANE SHIFT TRAFFIC CONTROL.

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- NOTES:
1. THIS DETOUR PLAN WHILE 40TH AVE. EAST IS UNDER CONSTRUCTION WITH LONDON ROAD LANE-SHIFT TRAFFIC CONTROL.
 2. SEE LAYOUT 25 OF THE MMUCD FOR LONDON ROAD LANE SHIFT TRAFFIC CONTROL.
 3. CONTRACTOR MAY MOVE END TAPER FROM 35TH AVE E TO 39TH AVE E ONCE WORK IS COMPLETE ON WESTERN END OF PROJECT.

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: Howard D. Smith, P.E.

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

LIC. NO: 46875



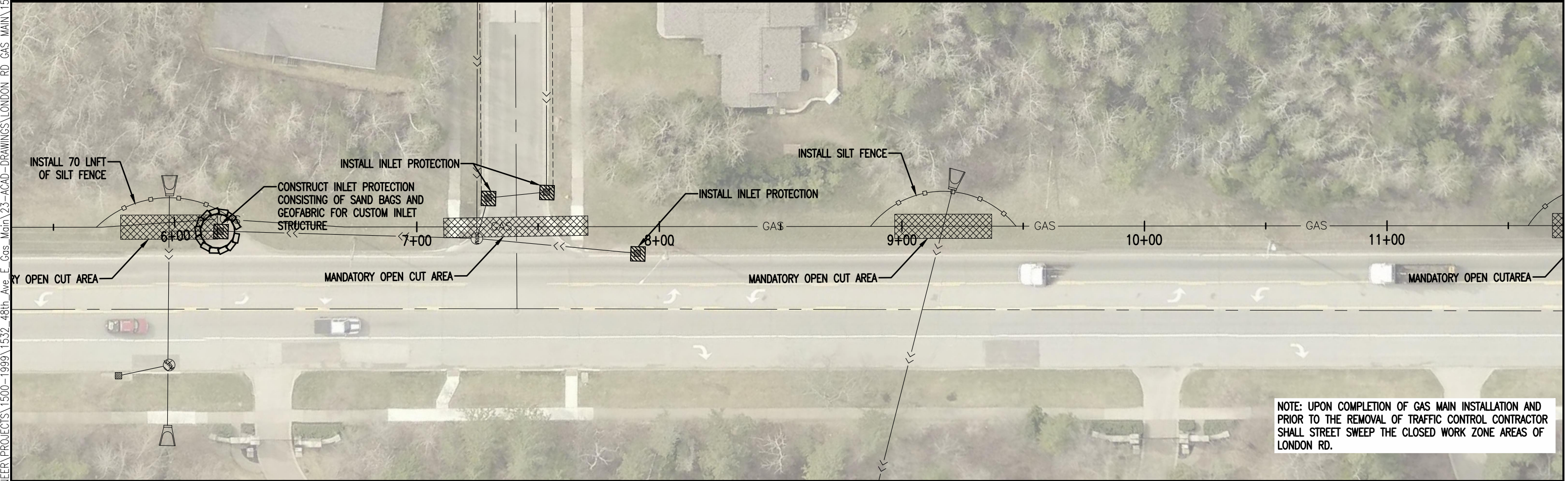
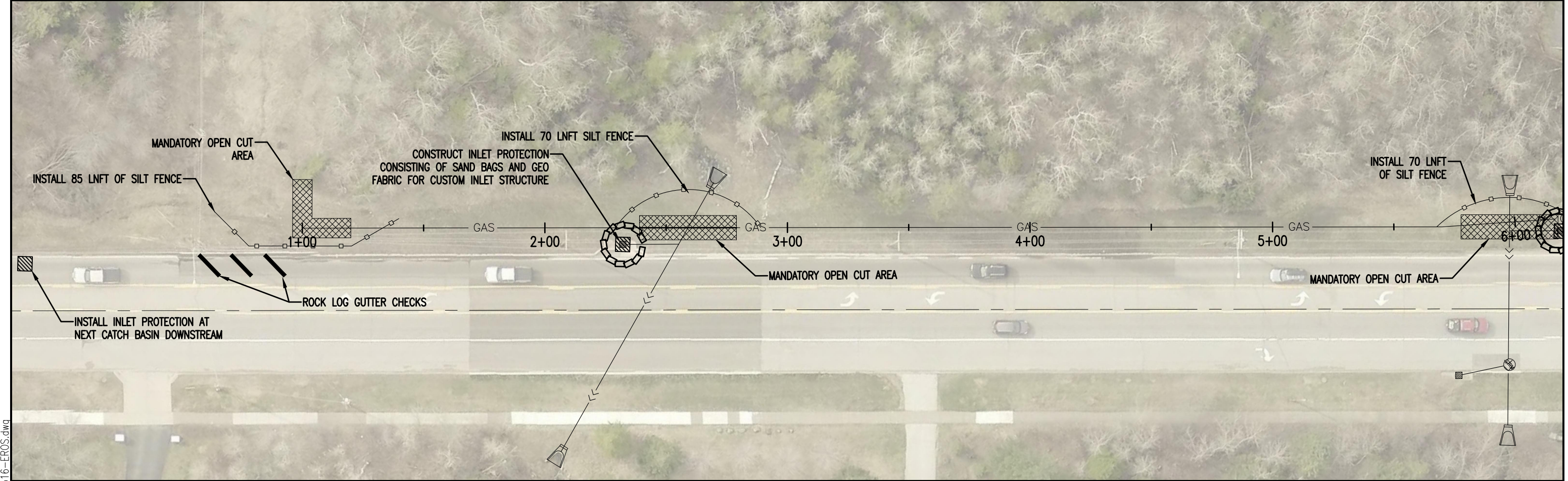
CITY OF DULUTH
ENGINEERING DIVISION
411 W. 1ST ST. STE. 211
DULUTH, MN 55802

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

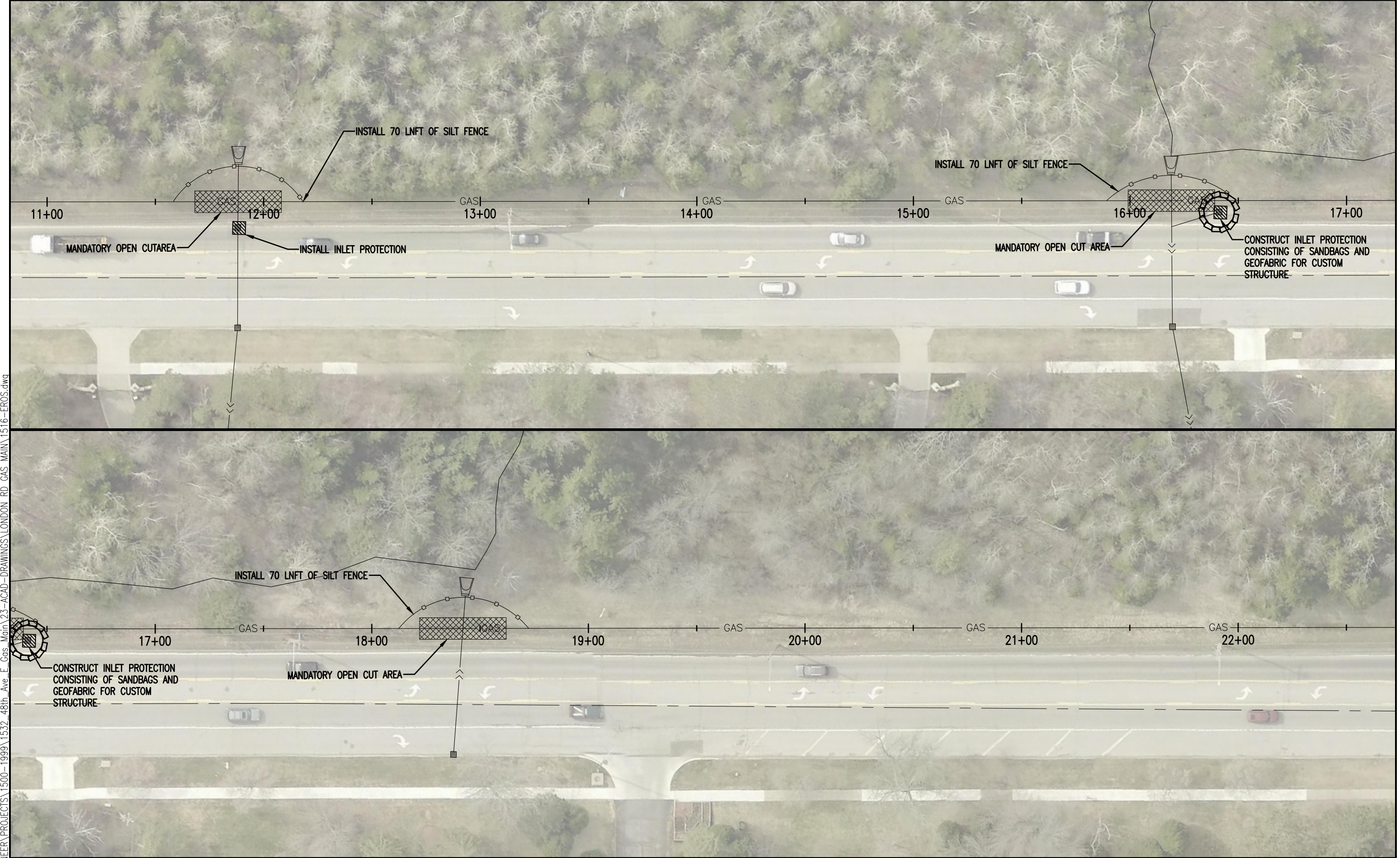
CITY PROJECT NO.: 1532

STATE AID PROJECT NO.: NA

DRAWN BY: KLM
LONDON RD TRAFFIC CONTROL 3
SHEET NO. 43 OF 54



NOTE: UPON COMPLETION OF GAS MAIN INSTALLATION AND PRIOR TO THE REMOVAL OF TRAFFIC CONTROL CONTRACTOR SHALL STREET SWEEP THE CLOSED WORK ZONE AREAS OF LONDON RD.



I:\PWU\ENGINEER\PROJECTS\1500-1999\1532-48th Ave. E. Gas Main\23-ACAD-DRAWINGS\LONDON RD GAS MAIN 1516-EROS.dwg

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SIGNATURE: Howard D. Smith, P.E.

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

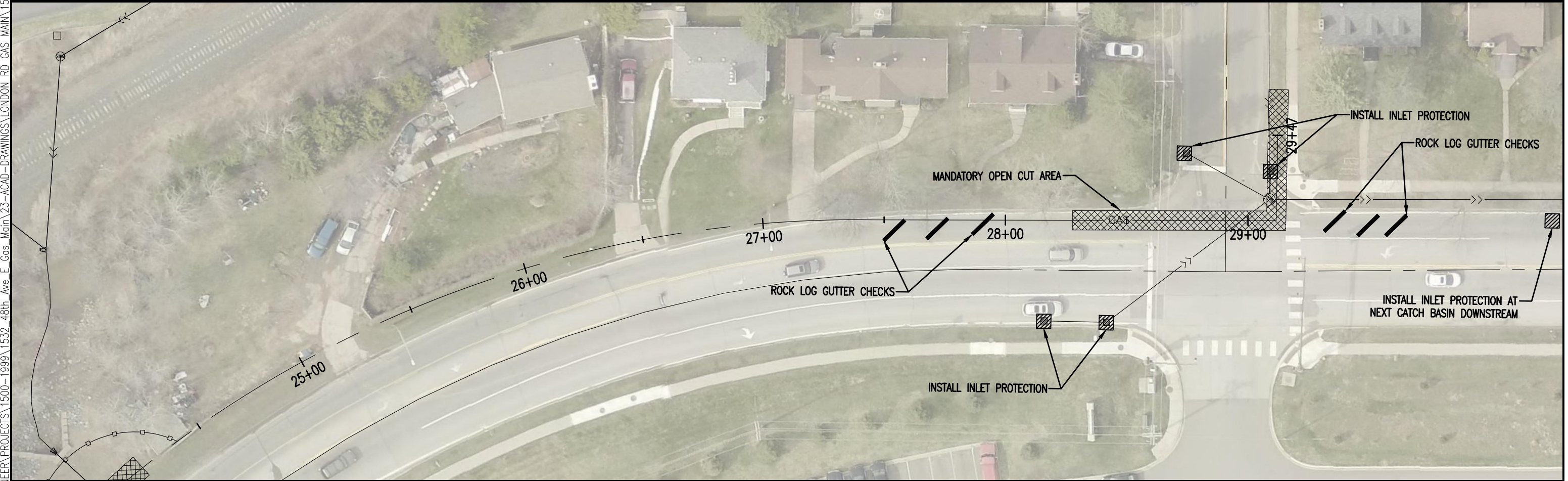
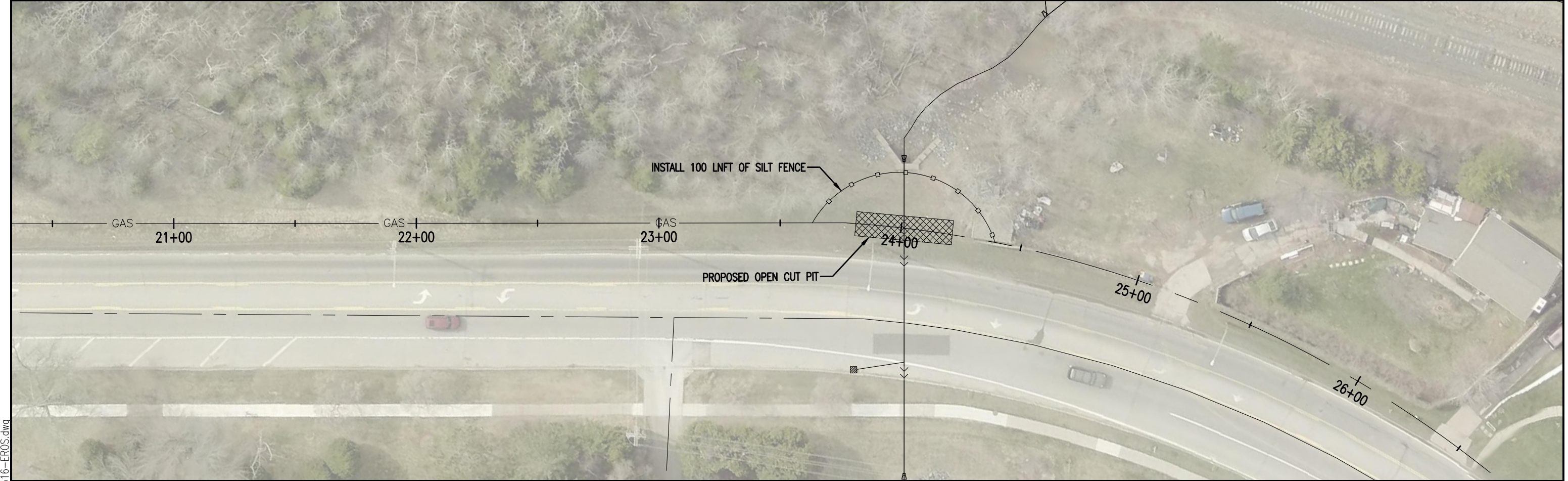
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CITY OF DULUTH
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411 W. 1ST ST. STE. 211
DULUTH, MN 55802

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.:	1532	STATE AID PROJECT NO.:	NA	SHEET NO.	45	OF	54
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SIGNATURE: Howard D. Smith, P.E.

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

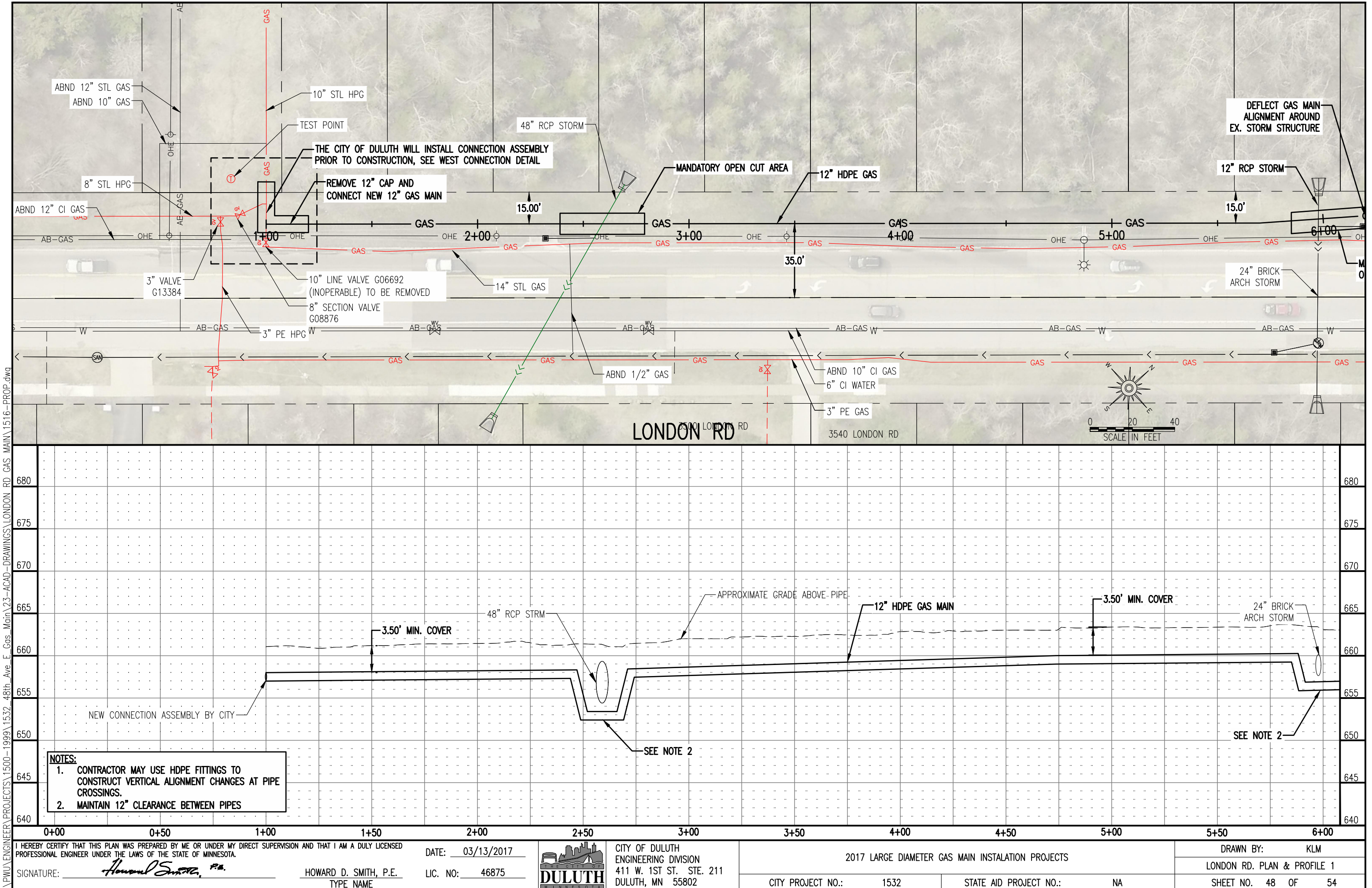
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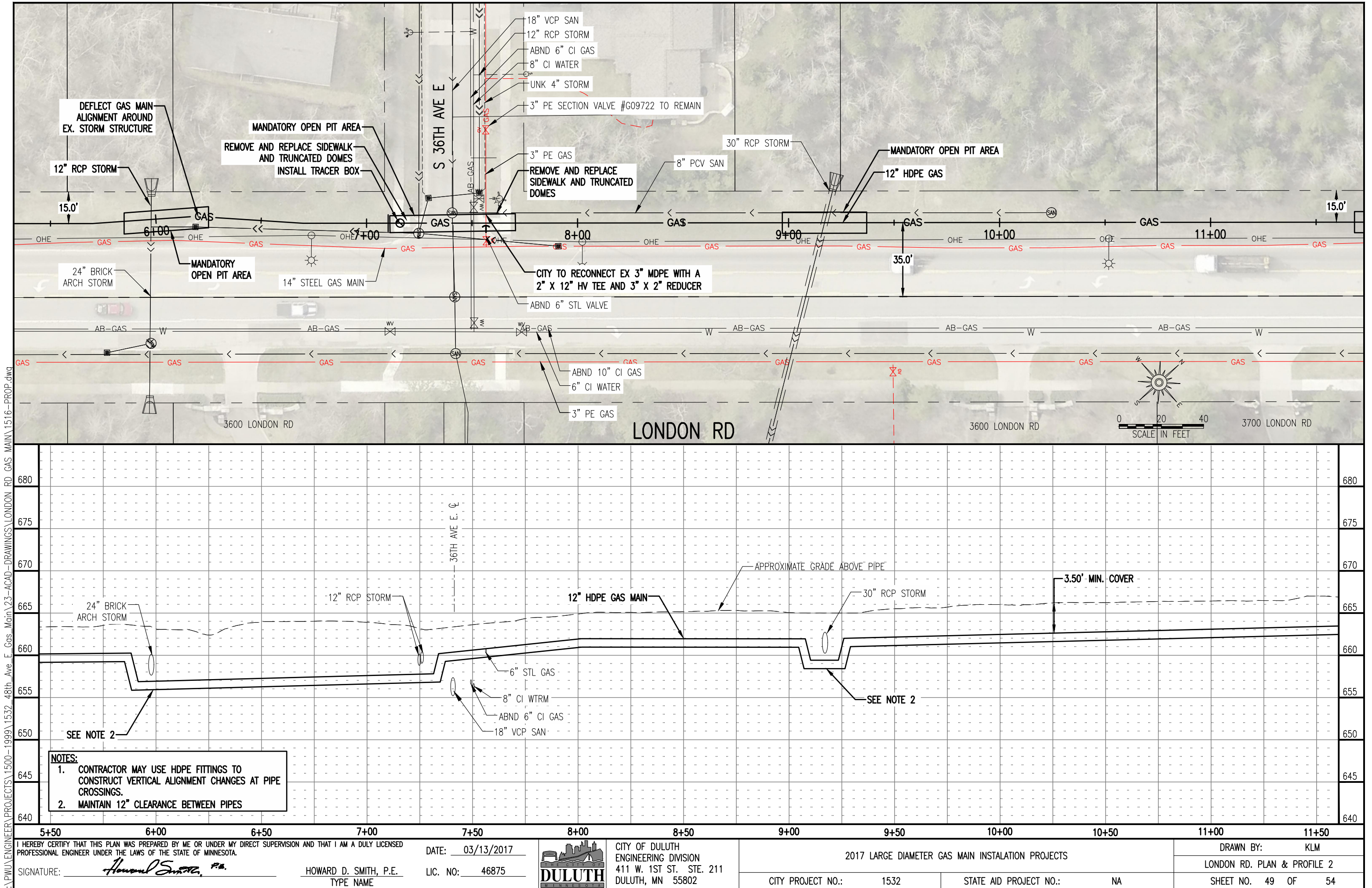


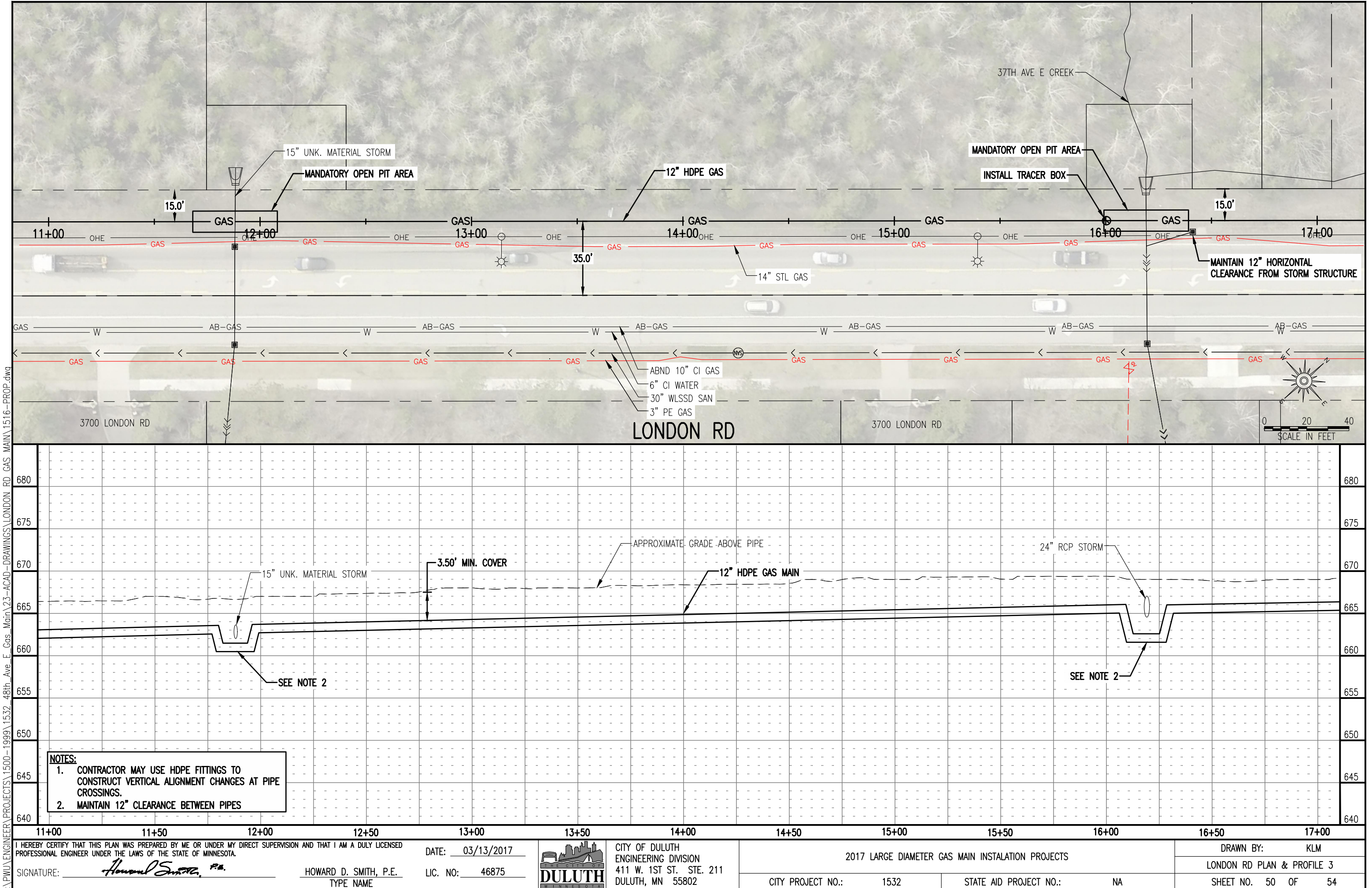
CITY OF DULUTH
ENGINEERING DIVISION
411 W. 1ST ST. STE. 211
DULUTH, MN 55802

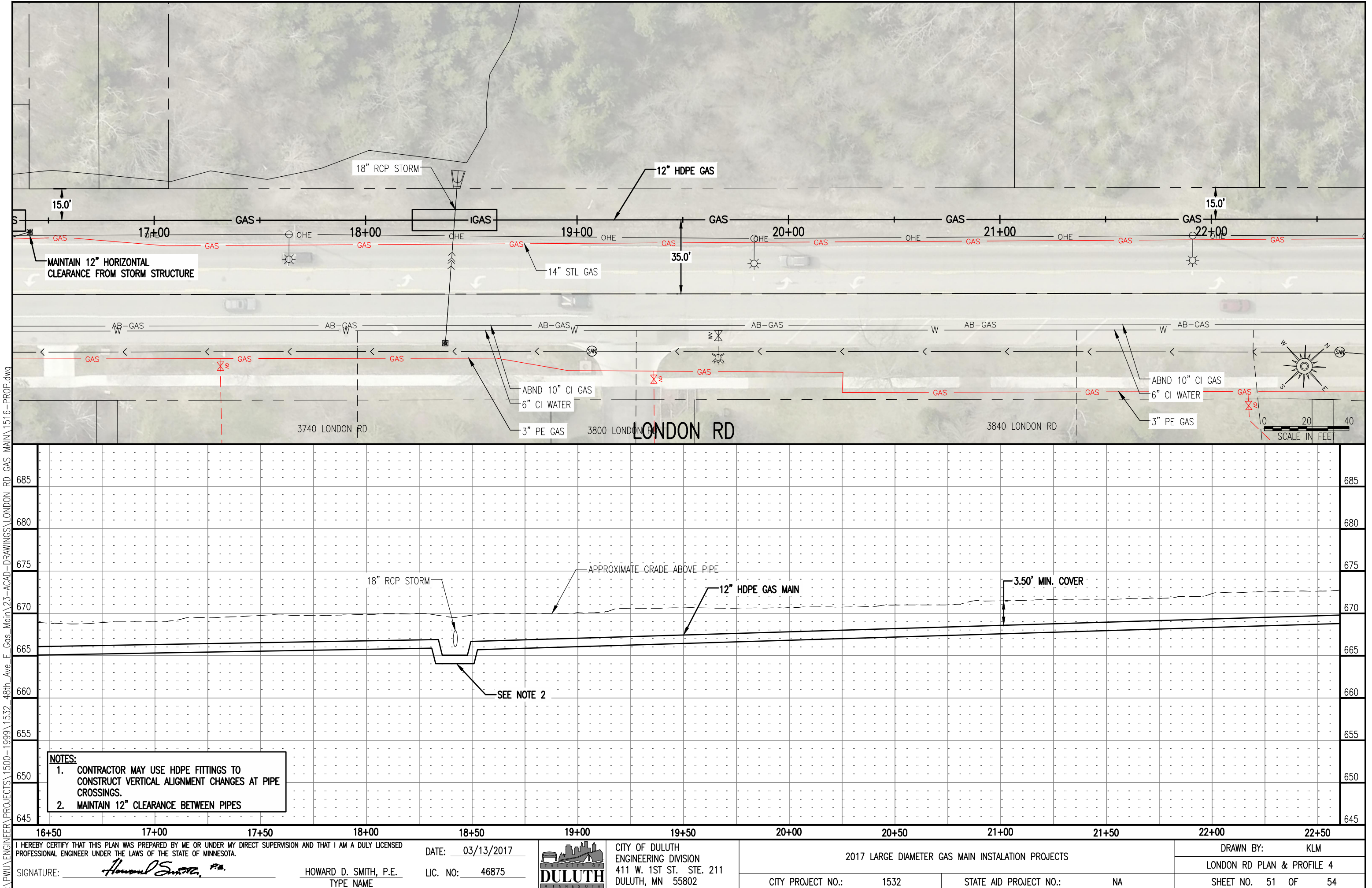
2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS	
CITY PROJECT NO.:	1532
STATE AID PROJECT NO.:	NA

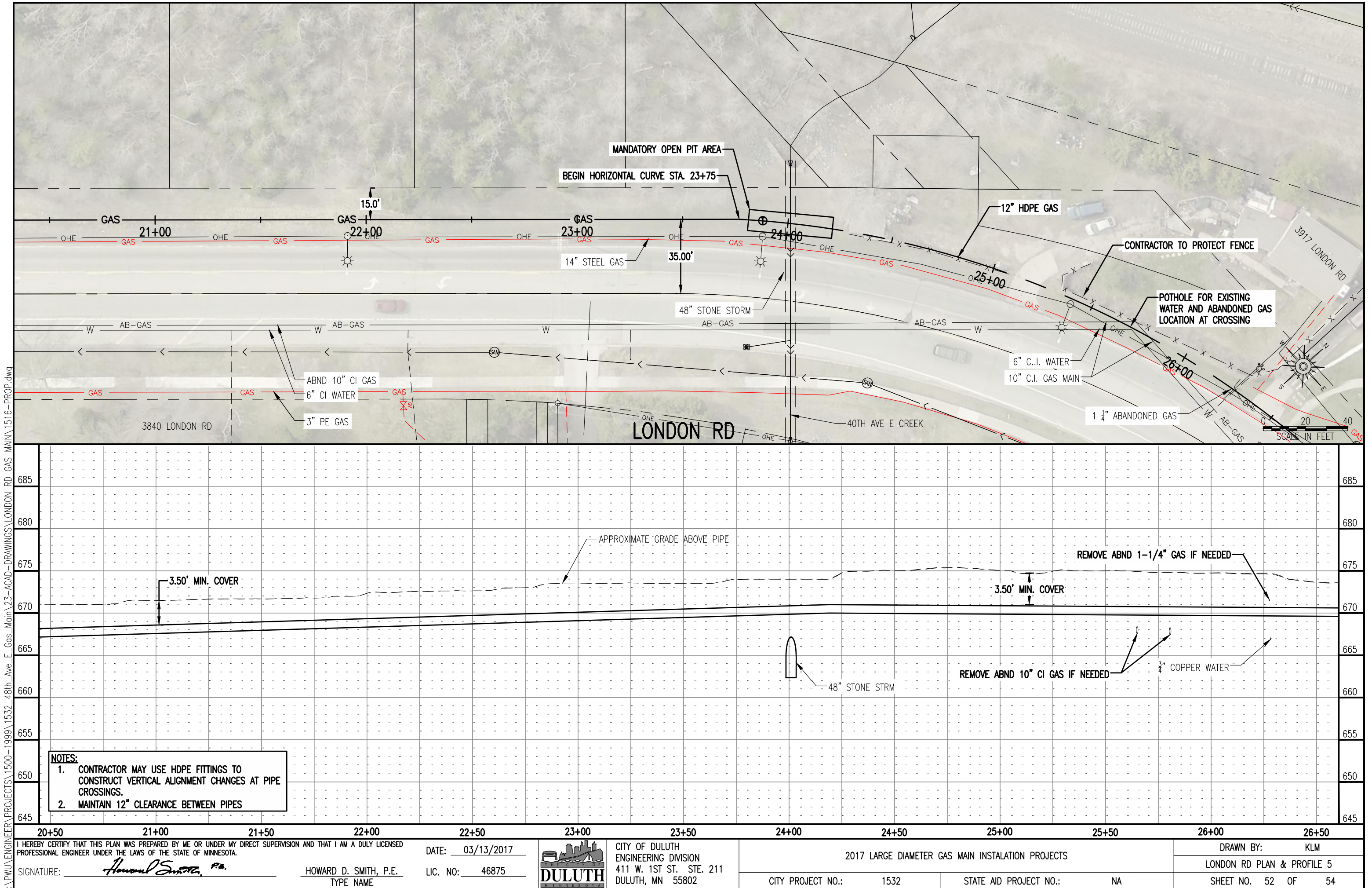
DRAWN BY:	J.R.L.
LONDON RD EROS 3	
SHEET NO.	46 OF 54









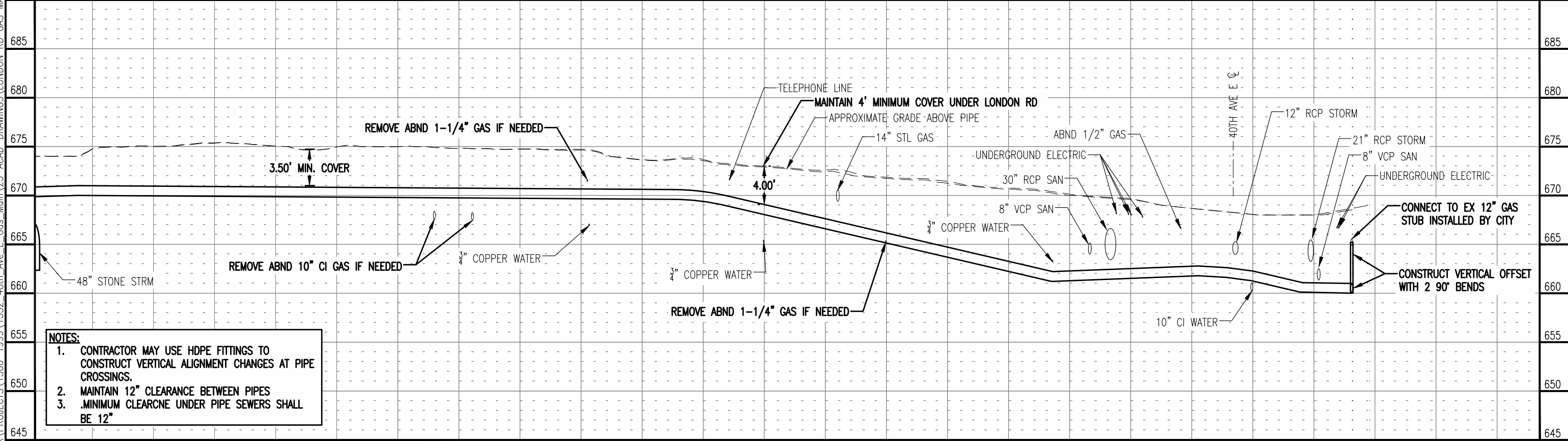
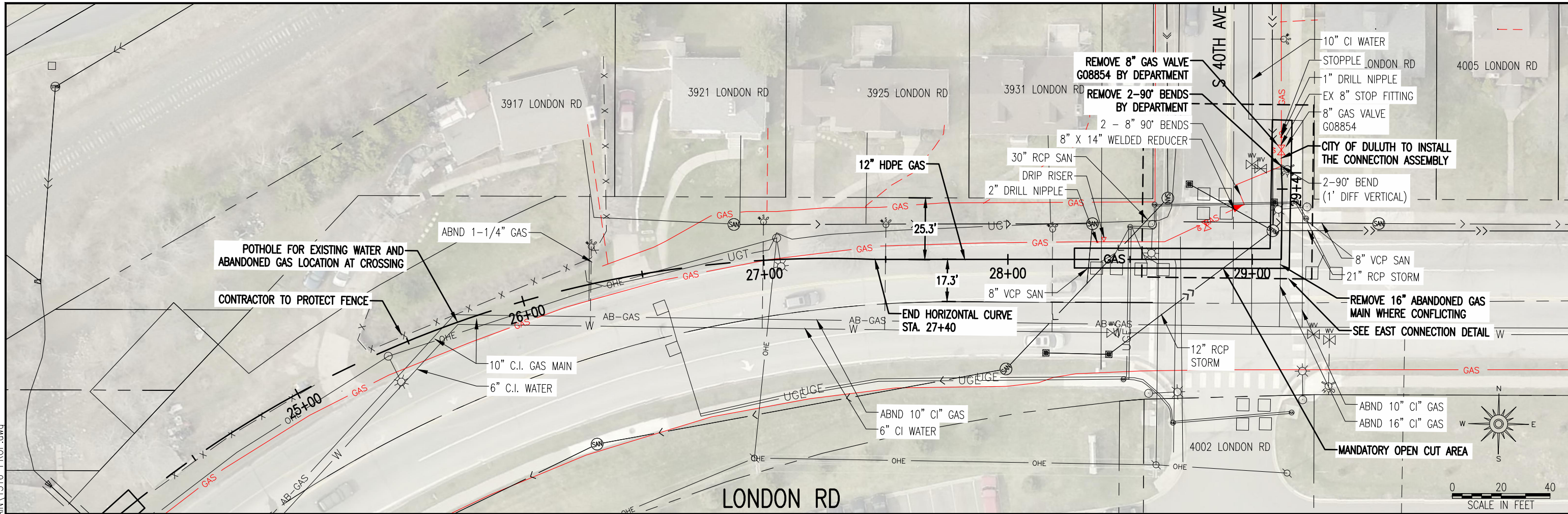


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- NOTES:
1. CONTRACTOR MAY USE HDPE FITTINGS TO CONSTRUCT VERTICAL ALIGNMENT CHANGES AT PIPE CROSSINGS.
 2. MAINTAIN 12" CLEARANCE BETWEEN PIPES

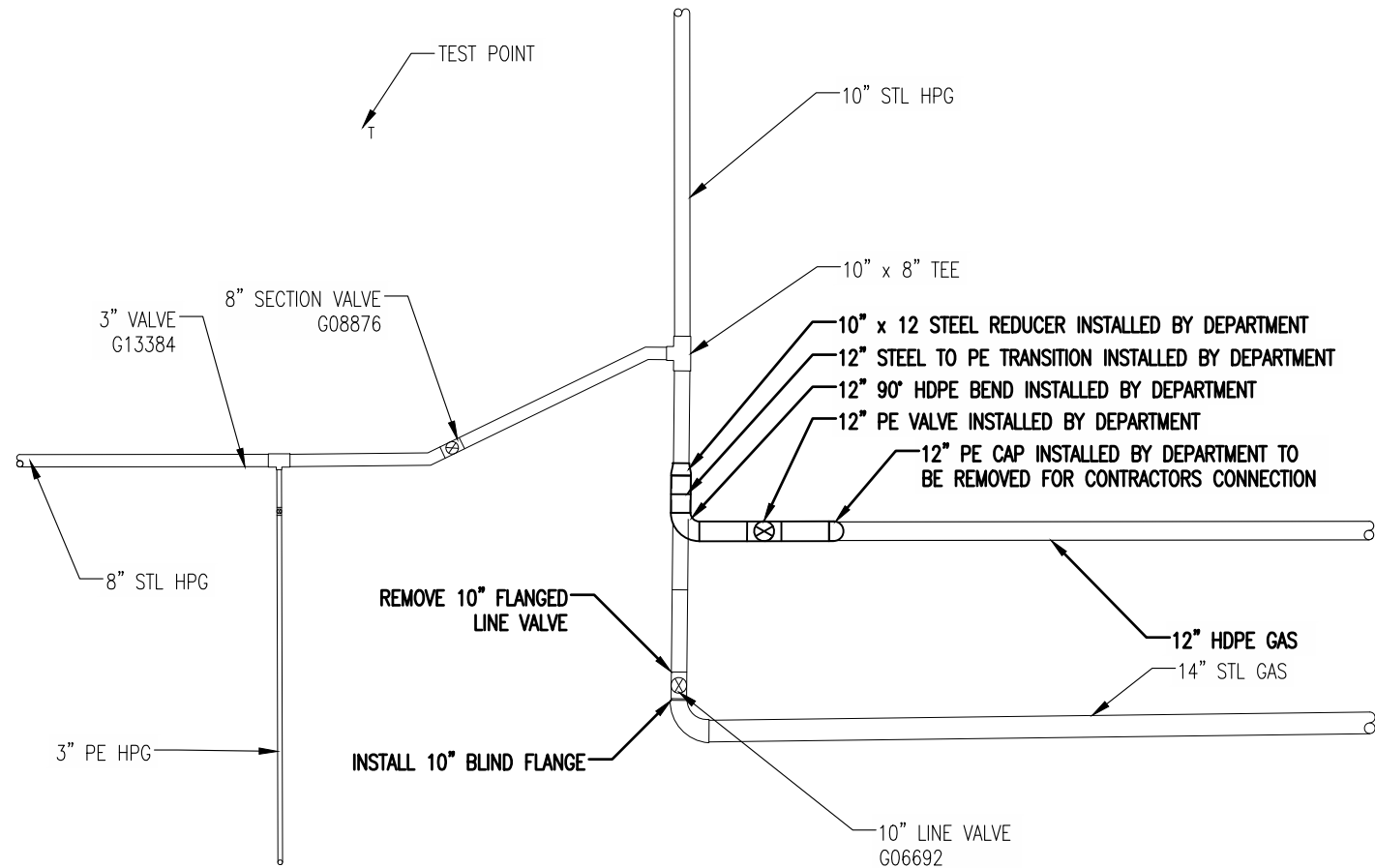
20+50		21+00		21+50		22+00		22+50		23+00		23+50		24+00		24+50		25+00		25+50		26+00		26+50				
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SIGNATURE: <u>Howard D. Smith, P.E.</u>												DATE: <u>03/13/2017</u>				CITY OF DULUTH ENGINEERING DIVISION 411 W. 1ST ST. STE. 211 DULUTH, MN 55802		2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS										
HOWARD D. SMITH, P.E. TYPE NAME												LIC. NO: <u>46875</u>						CITY PROJECT NO.: 1532					STATE AID PROJECT NO.: NA					DRAWN BY: KLM LONDON RD PLAN & PROFILE 5
																SHEET NO. 52 OF 54												

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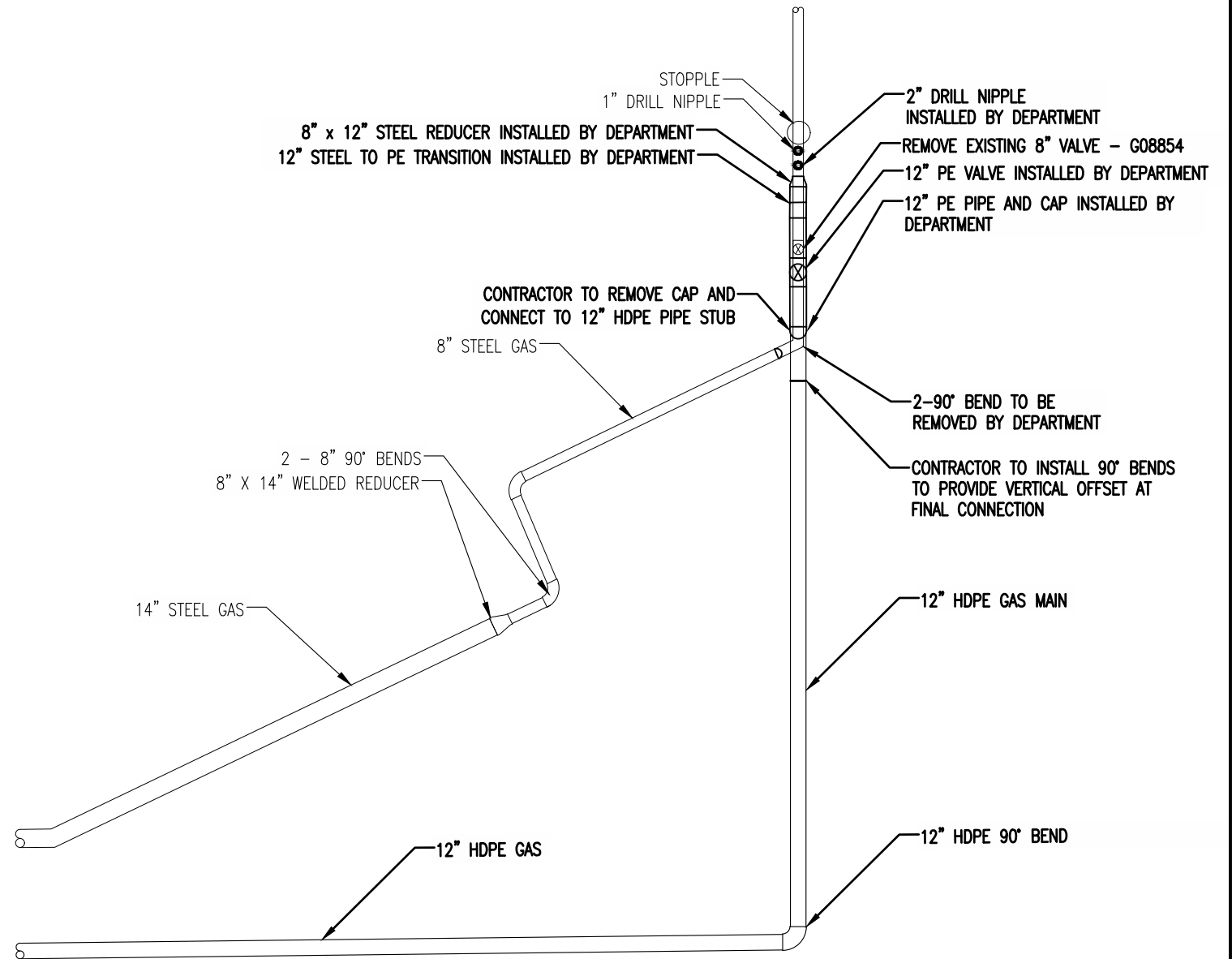


- NOTES:**
1. CONTRACTOR MAY USE HDPE FITTINGS TO CONSTRUCT VERTICAL ALIGNMENT CHANGES AT PIPE CROSSINGS.
 2. MAINTAIN 12" CLEARANCE BETWEEN PIPES
 3. MINIMUM CLEARCNE UNDER PIPE SEWERS SHALL BE 12"

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WEST CONNECTION DETAIL
SCALE = 1: 10



EAST CONNECTION DETAIL
SCALE = 1: 10

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: Howard D. Smith, P.E.

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 03/13/2017

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

2017 LARGE DIAMETER GAS MAIN INSTALATION PROJECTS

CITY PROJECT NO.: 1532

STATE AID PROJECT NO.: NA

DRAWN BY: J.R.L.

LONDON RD CONNECTION DETAIL

SHEET NO. 54 OF 54