

PLAN LEGEND

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

SYMBOLS

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

CITY OF DULUTH

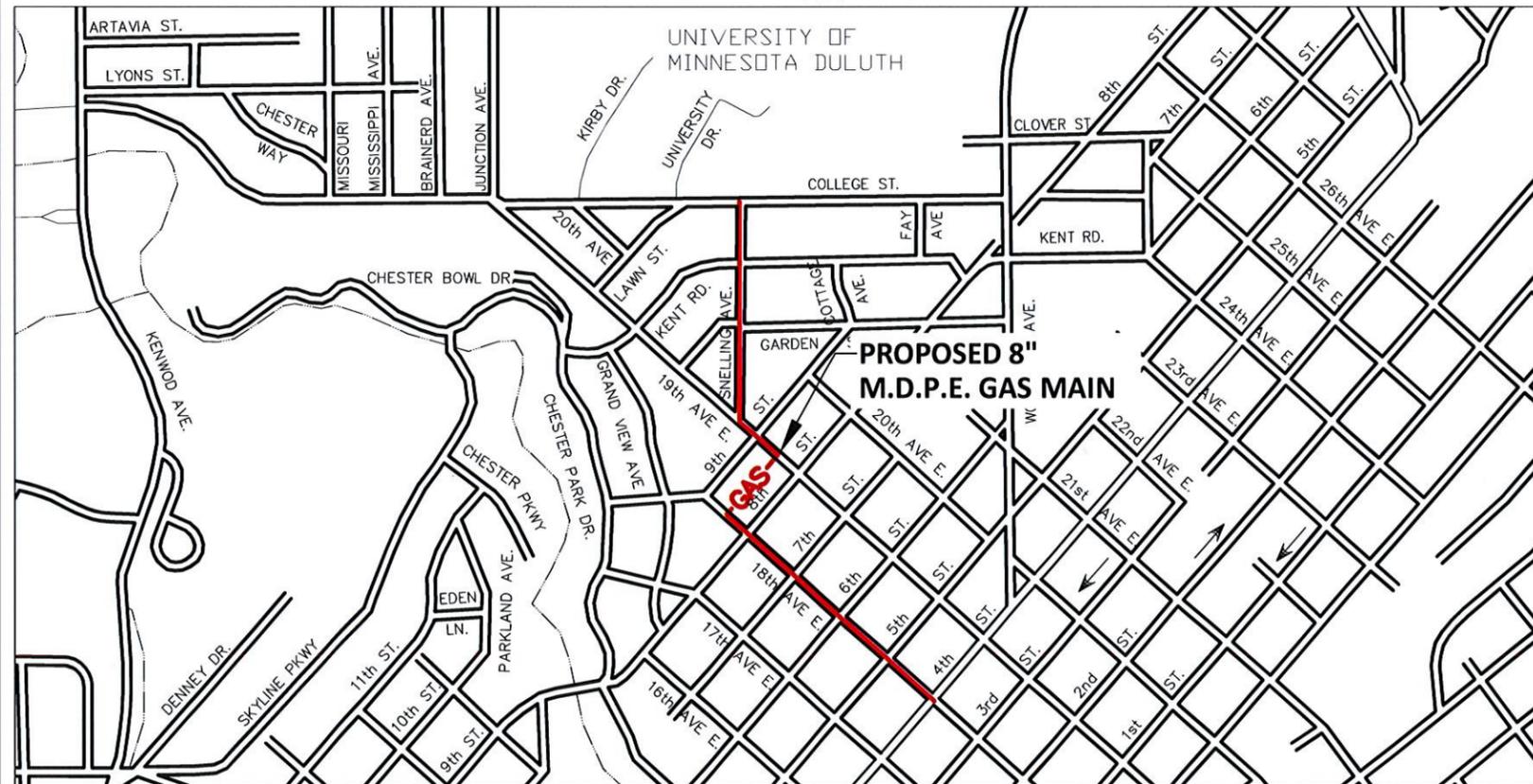
DEPARTMENT OF PUBLIC WORKS AND UTILITIES ENGINEERING DIVISION

CONSTRUCTION PLANS FOR:

18TH AVENUE. EAST GAS MAIN TO U.M.D.

3647 LN FT OF 8" M.D.P.E. GAS MAIN

CITY PROJECT NO. 1410



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

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

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

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THIS PLAN CONTAINS 44 SHEETS

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

HOWARD D. SMITH, P.E.
PROJECT ENGINEER (TYPED OR PRINTED NAME)
Howard D. Smith, P.E. 5-17-2016 46875
PROJECT ENGINEER DATE LIC. NO.

CITY APPROVAL
[Signature] 5-18-16
APPROVED CHIEF ENGINEER OF TRANSPORTATION DATE

[Signature] 5-18-16
APPROVED CHIEF ENGINEER OF UTILITIES DATE

[Signature] 5-18-16
APPROVED CITY ENGINEER DATE

STATEMENT OF ESTIMATED QUANTITIES

1		2021.501	MOBILIZATION	1	LUMP SUM
2		2104.501	REMOVE PE OR STEEL GAS MAIN	140	LN FT
3		2104.503	REMOVE CONCRETE PAVEMENT	568	SQ YD
4		2104.503	REMOVE BITUMINOUS PAVEMENT	50	SQ YD
5		2105.503	BOULDER EXCAVATION (TRENCH)	5	CU YD
6		2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH)	2334	LIN FT
7		2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	105	LIN FT
8		2105.503	ROCK EXCAVATION (TRENCH)	60	CU YD
9		2105.522	SELECT GRANULAR BORROW (CV)	20	CU YD
10		2201.503	CONCRETE BASE PAVEMENT	9	CU YD
11		2211.503	AGGREGATE BASE (CV) CLASS 5	85	CU YD
12		2301.501	STRUCTURAL CONCRETE (3Y43)	112	CU YD
13		2301.602	DRILL & GROUT DOWEL BAR (EPOXY COATED) 1"DIA X 18" LONG	40	EACH
14		2360.501	TYPE SP 9.5 WEARING COURSE MIXTURE (3,C)	116	TON
15		2360.501	TYPE SP 12.5 NON WEARING COURSE MIXTURE (3,C)	72	TON
16		2451.607	FURNISH GRANULAR BACKFILL (CV)	421	CU YD
17		2505.602	CUT OFF GAS MAIN ONLY	6	EACH
18		2505.602	RECONNECT BRANCH GAS MAIN (INCLUDES CUT OFF)	12	EACH
19		2505.602	RECONNECT EXISTING PE SERVICES TO NEW MAIN	17	EACH
20		2505.602	FURNISH & INSTALL 8" PE VALVE & VALVE BOX	2	EACH
21		2505.602	FURNISH & INSTALL 3" PE VALVE & VALVE BOX	3	EACH
22		2505.602	FURNISH & INSTALL 2" PE VALVE & VALVE BOX	7	EACH
23		2503.603	8" PE GAS MAIN (DRILLED)	1685	LN FT
24		2505.603	8" PE GAS MAIN (OPEN CUT)	1962	LN FT
25		2507.603	3" PE GAS MAIN	20	LN FT
26		2509.603	2" PE GAS MAIN	287	LN FT
27		2509.603	2" PE GAS MAIN TEMPORARY (INCLUDES REMOVAL)	330	LN FT
28		2511.603	1/2" PE GAS SERVICE	21	LN FT
29		2505.604	3" POLYSTYRENE INSULATION	128	SQ FT
30		2531.501	CONCRETE CURB & GUTTER DESIGN B624	60	LIN FT
31		2531.501	4" CONCRETE SIDEWALK (INCLUDES 4" GRAVEL BASE)	2320	SQ FT
32		2563.601	TRAFFIC CONTROL	1	LUMP SUM
33		2531.618	TRUNCATED DOMES	80	SQ FT
34		2573.533	SEDIMENT CONTROL LOG TYPE ROCK	14	EACH
35		2573.533	STORM DRAIN INLET PROTECTION	26	EACH
36		2575.533	INLET SAND BAG DIVERSION	14	EACH
37		2575.555	TURF ESTABLISHMENT	363	SQ YD

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

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 05//17/2016

LIC. NO: 46875



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

18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

CITY PROJECT NO.: 1410

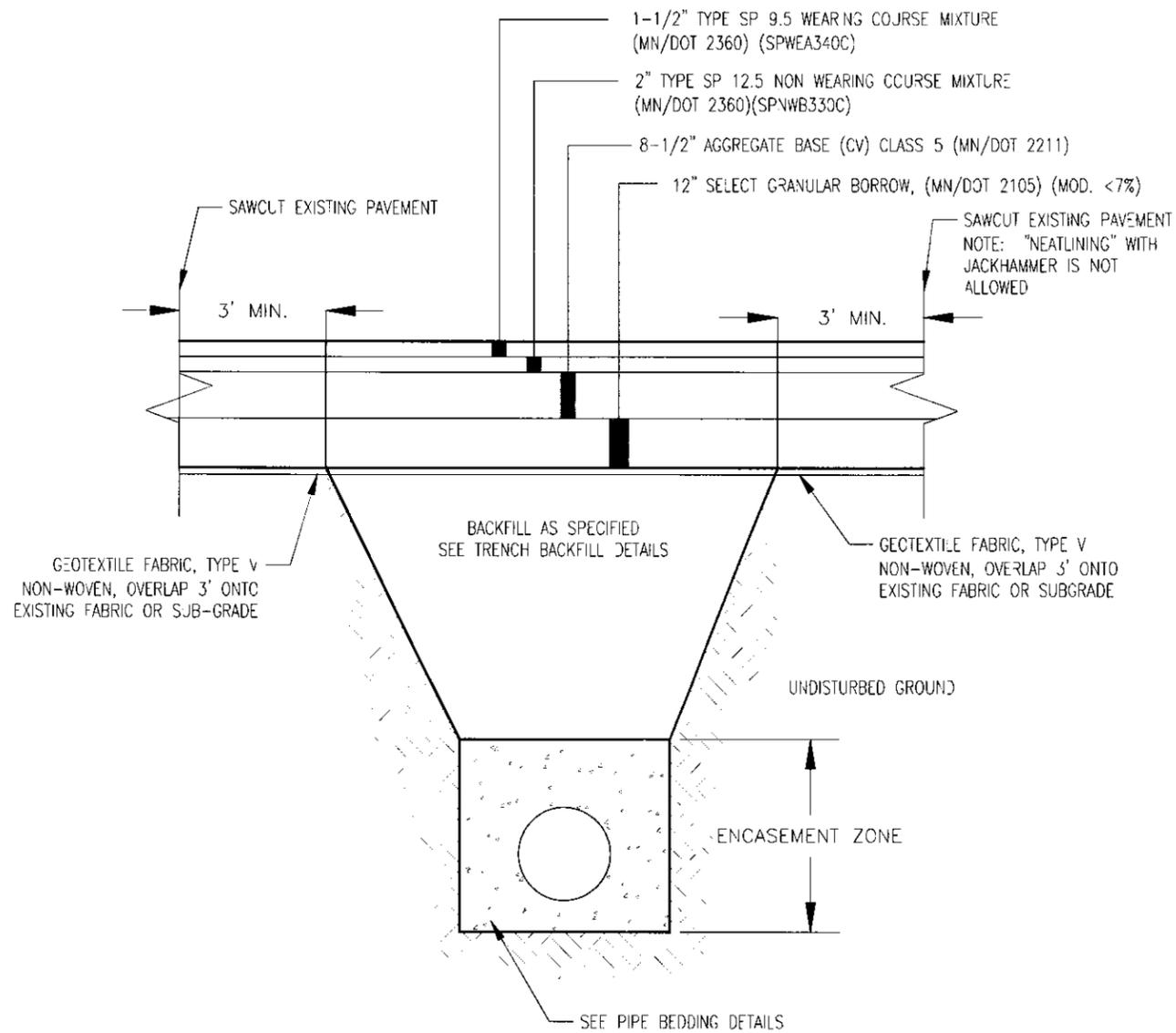
STATE AID PROJECT NO.:

DRAWN BY: JRL

S.E.Q.

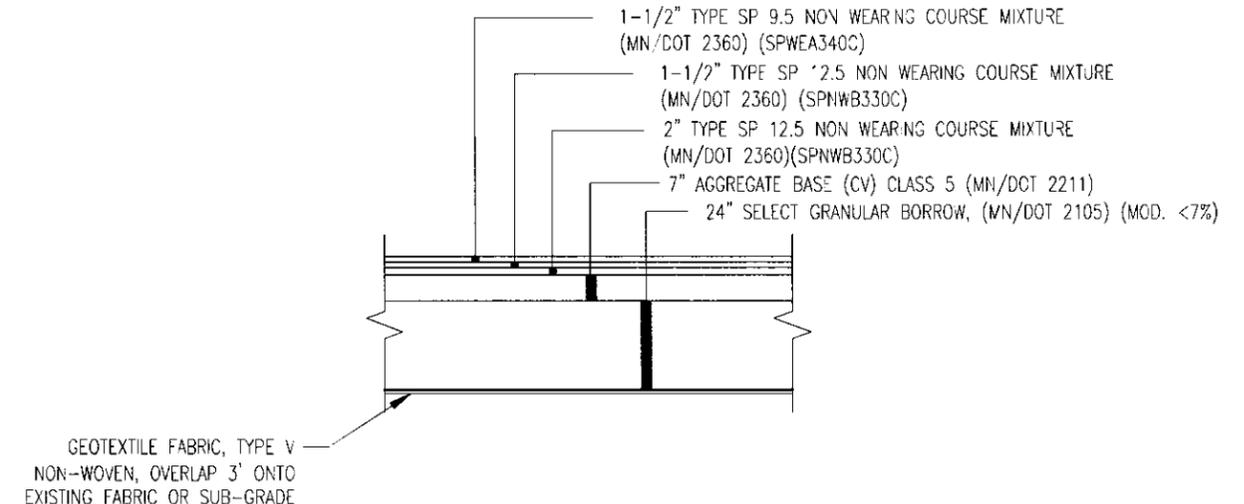
SHEET NO. 2 OF 44

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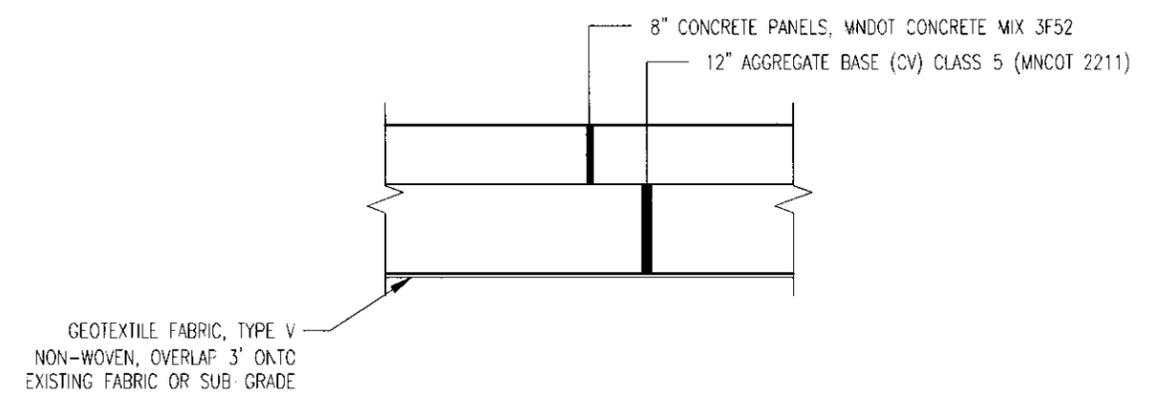


NOTES:
THIS DETAIL IS APPLICABLE TO 18TH AVENUE EAST AND SNELLING AVENUE RESTORATIONS.

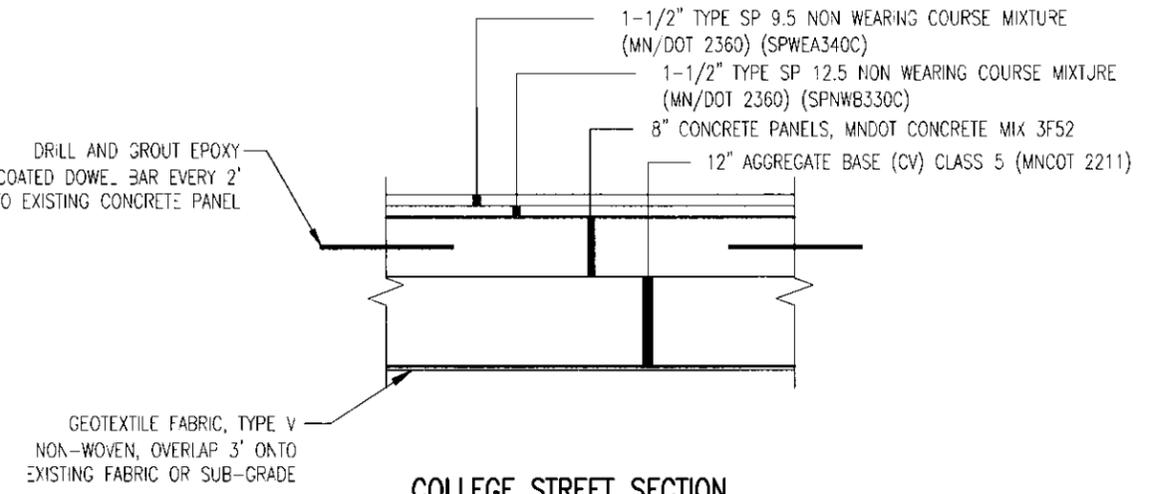
STREET RESTORATION OVER TRENCH
CITY OF DULUTH STANDARD DETAIL STR-8



19TH AVE E. STREET SECTION



9TH STREET ALLEY SECTION



COLLEGE STREET SECTION

NOTES:
1. INSTALL SEALANT IN NEW CONSTRUCTION AND CONTROL JOINTS, MAXIMUM SIZE PANELS SHALL BE 8'x8', SAW CONTROL JOINTS 1/3 DEPTH

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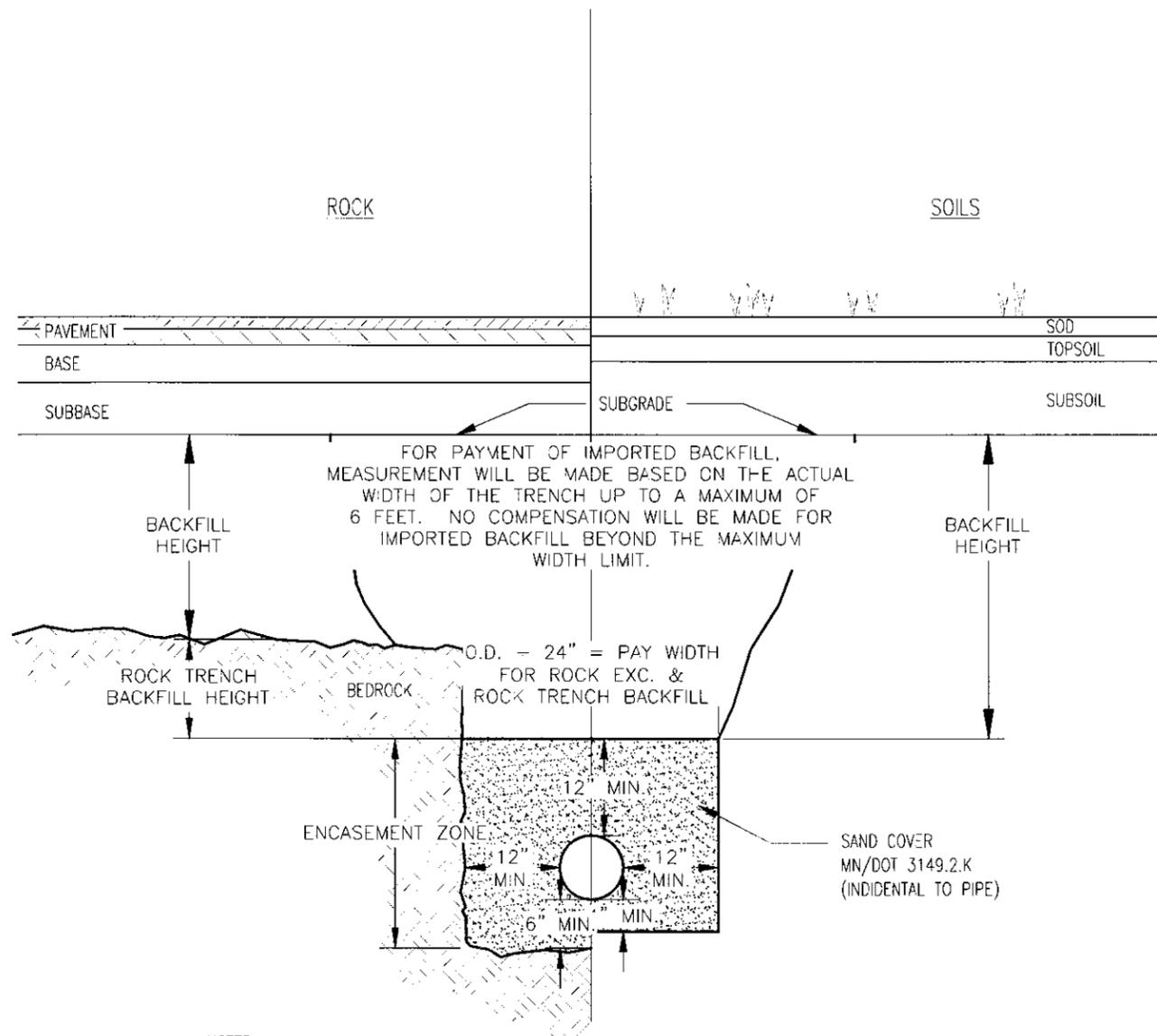
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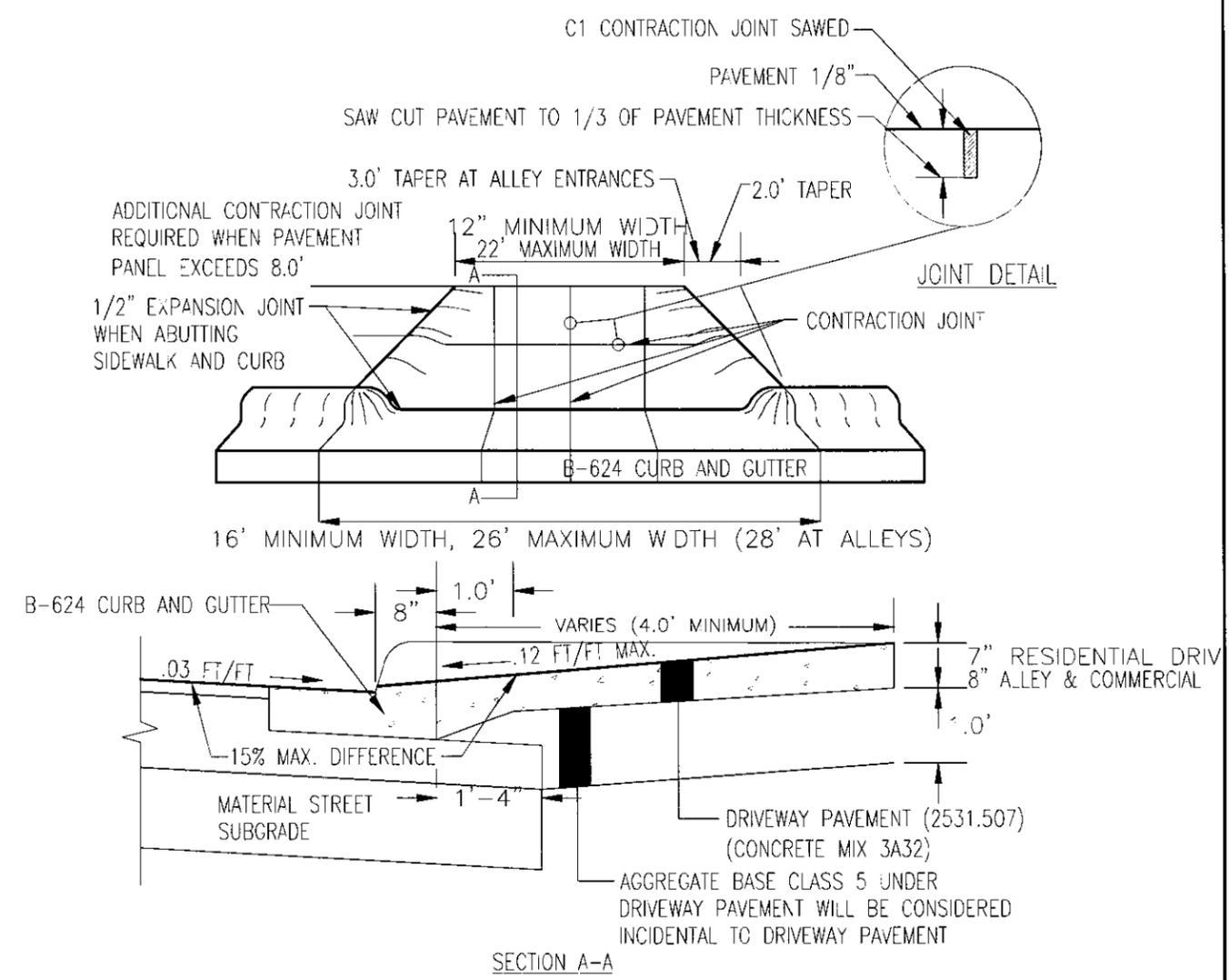
18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.
CITY PROJECT NO.: 1410 STATE AID PROJECT NO.: ----

DRAWN BY: JRL
TYPICAL DETAILS
SHEET NO. 3 OF 44



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

ALL STEEL & 4" AND LAGRER P.E. GAS MAIN BEDDING DETAIL
CITY OF DULUTH STANDARD DETAIL EX-2



- NOTES:
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

DRIVEWAY AND ALLEY ENTRANCES
CITY OF DULUTH STANDARD DETAIL STR-5

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ENGINEERING DIVISION
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DULUTH, MN 55802

18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

CITY PROJECT NO.: 1410

STATE AID PROJECT NO.: ----

DRAWN BY: JRL

TYPICAL DETAILS

SHEET NO. 4 OF 44

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-PERMITTEE 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 (QC) 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. IF ANY STOCKPILE IS TO REMAIN IN PLACE FOR MORE THAN 3 DAYS SEDIMENT AND EROSION CONTROL DEVICES SHALL BE USED.
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 FLOCCULANT 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 BLANKET (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.

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18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

CITY PROJECT NO.: 1410

STATE AID PROJECT NO.:

DRAWN BY: JRL

SWPPP

SHEET NO. 5 OF 44

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 0.0 ACRES.
3. CONSTRUCTION DATES ARE ESTIMATED TO BE FROM JUNE 15, 2016 TO NOVEMBER 1, 2016.
4. THE RECEIVING WATER FOR STORM WATER FROM THE PROJECT INCLUDES EXISTING STORM SEWER SYSTEMS LEADING TO CHESTER CREEK, 18TH AVE E. CREEK, OREGON CREEK, & 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 PROJECT AREA = 1.7 ACRES
 TOTAL DISTURBED AREA = .25 ACRES
 POST CONSTRUCTION IMPERVIOUS AREA = .15 ACRES
 EXISTING IMPERVIOUS AREA = .15 ACRES
 IMPERVIOUS NET = 0 ACRES (INCREASE/DECREASE)
 SOILS INFORMATION: HEAVY SILTS, CLAY

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 4.5 MILES FROM THE PROJECT AND IS AN MPCA LISTED IMPAIRED WATER.

LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN		
DESCRIPTION	TITLE	LOCATION
SUMMARY OF PERVIOUS & IMPERVIOUS	SWPPP	SHEET 6
DIRECTION OF FLOW/DRAINAGE AREA	EROSION CONTROL PLAN	SHEETS 8-10
RECEIVING SURFACE WATERS	SHEET LAYOUT	SHEETS 21
NO DISTURBANCE AREAS & AREAS OF CONSTRUCTION	PLAN & PROFILE SHEETS	SHEETS 22-29
DRAINAGE STRUCTURES	EROSION CONTROL PLAN	SHEETS 8-10
DRAINAGE TABULATIONS	N/A	N/A
EROSION CONTROL TABULATIONS	S.E.Q.	SHEET 2
EROSION CONTROL SHEETS	PLAN	SHEETS 8-10
EROSION CONTROL DETAILS	DETAILS	SHEETS 7
SEDIMENT CONTROL PRACTICES	SWPPP	SHEETS 5-6
FINAL STABILIZATION	S.E.Q.	SHEET 2
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 tajohnson@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

I:\PWU\ENGINEER\PROJECTS\2014\1410 18th Ave East Gas Main to UMD Drawings\1410-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: 05//17/2016

LIC. NO: 46875



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

18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

CITY PROJECT NO.: 1410

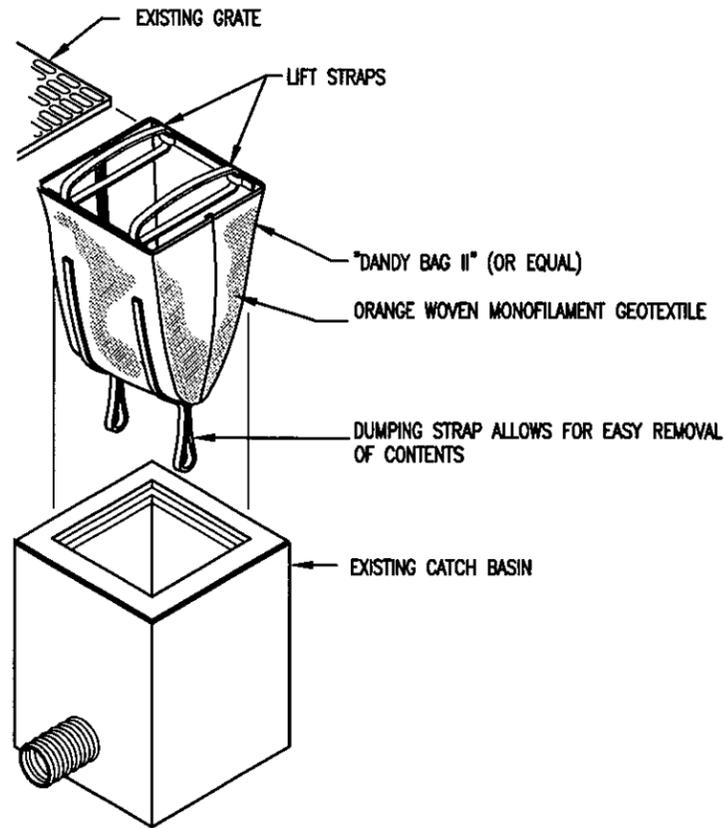
STATE AID PROJECT NO.:

DRAWN BY: JRL

SWPPP

SHEET NO. 6 OF 44

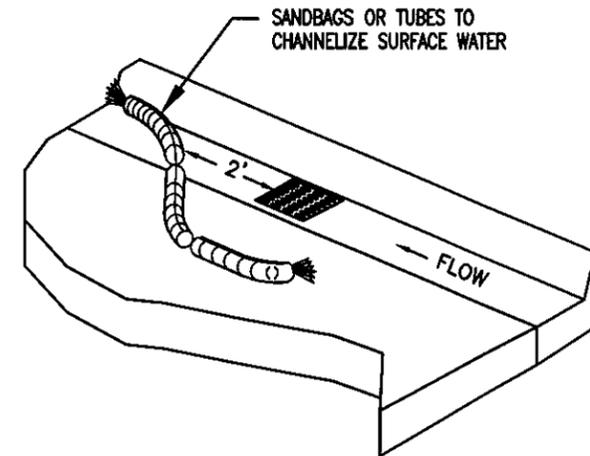
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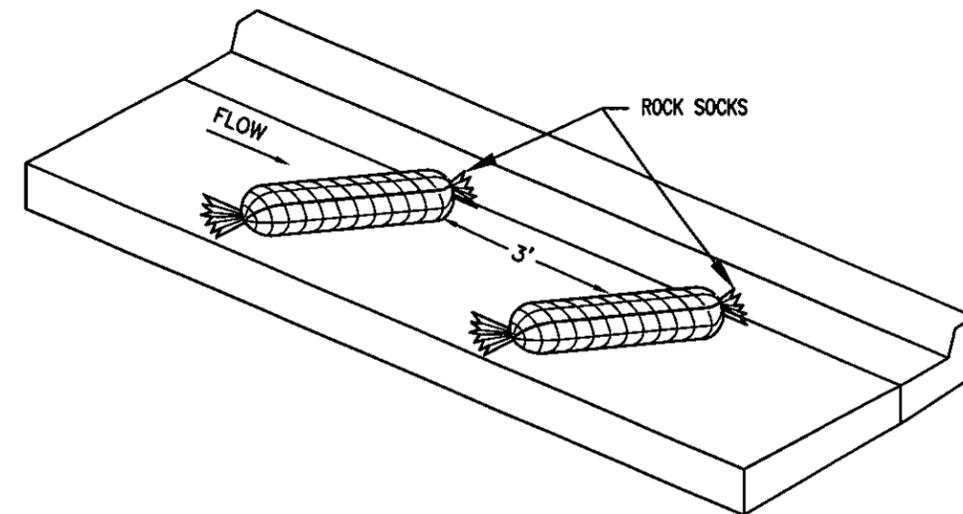
MAINTENANCE REQUIRED: FOLLOWING EACH RUNOFF EVENT, MONITOR AND, IF NECESSARY, REMOVE ALL ACCUMULATED SEDIMENT & DEBRIS FROM THE UNIT AFTER THE HEIGHT OF THE ACCUMULATED MATERIAL REACHES 1/3 OF THE HEIGHT OF THE SEDIMENT BAG.

**TYPE A
INLET PROTECTION
CATCH BASIN SEDIMENT BAG INSERT TYPE DETAIL**

NO SCALE



**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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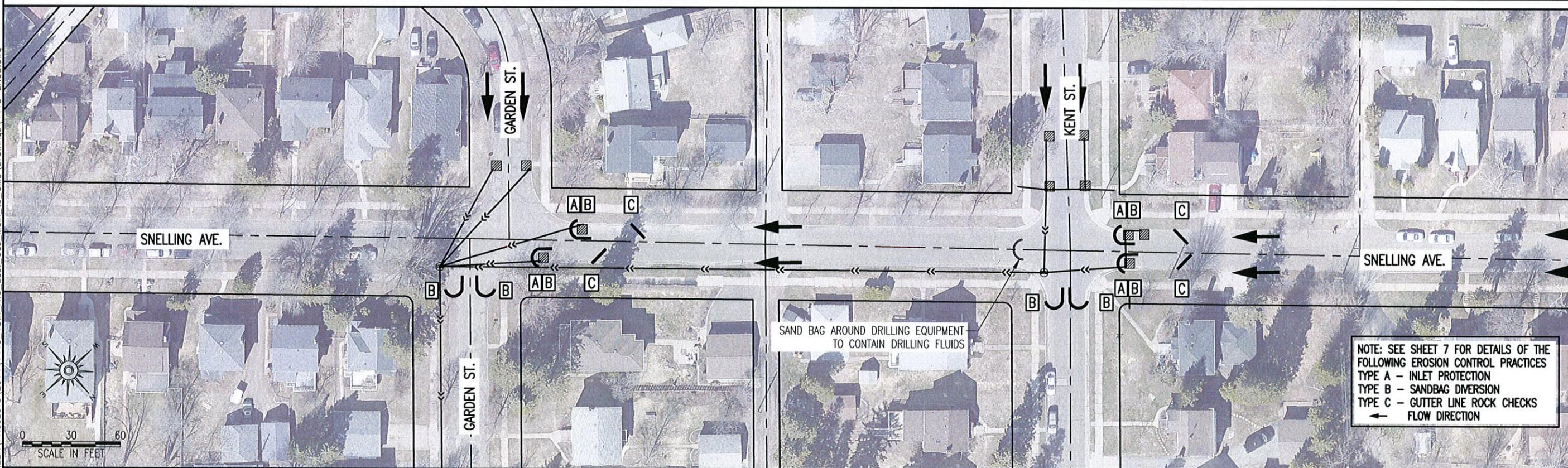
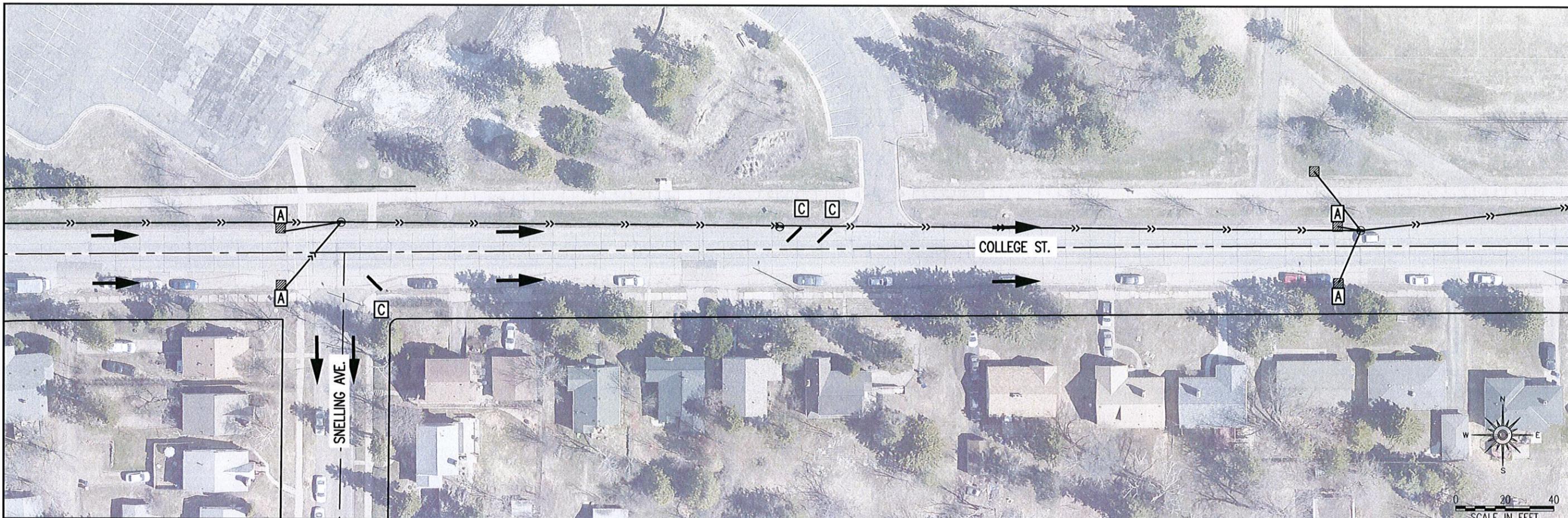
18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

STATE AID PROJECT NO.: ----

DRAWN BY: JRL

EROSION CONTROL DETAILS

SHEET NO. 7 OF 44



NOTE: SEE SHEET 7 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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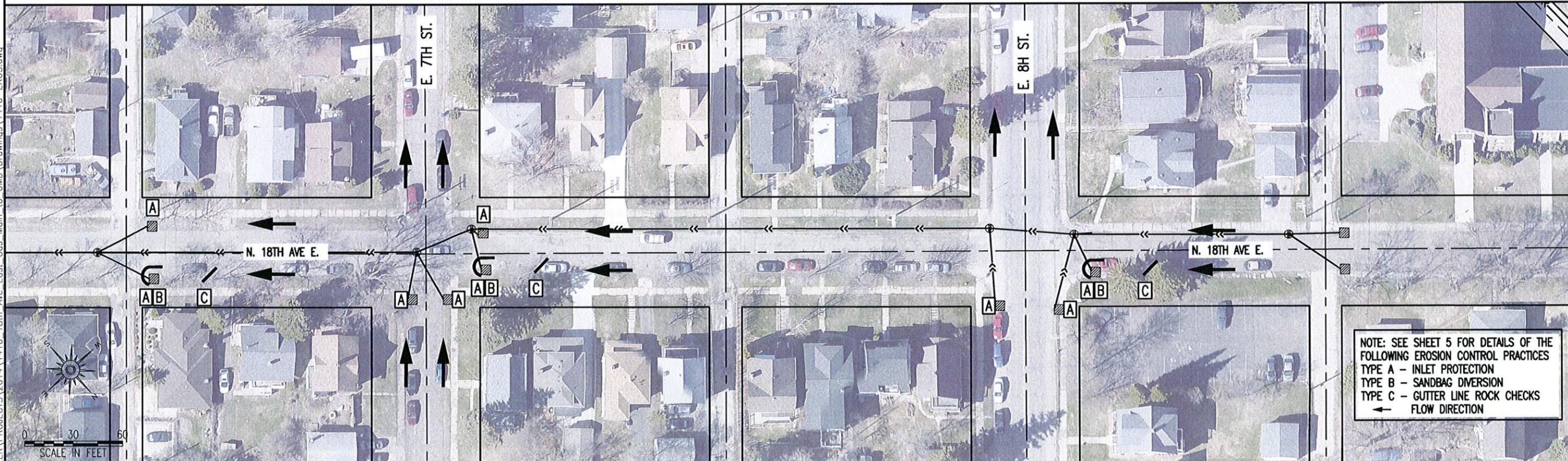
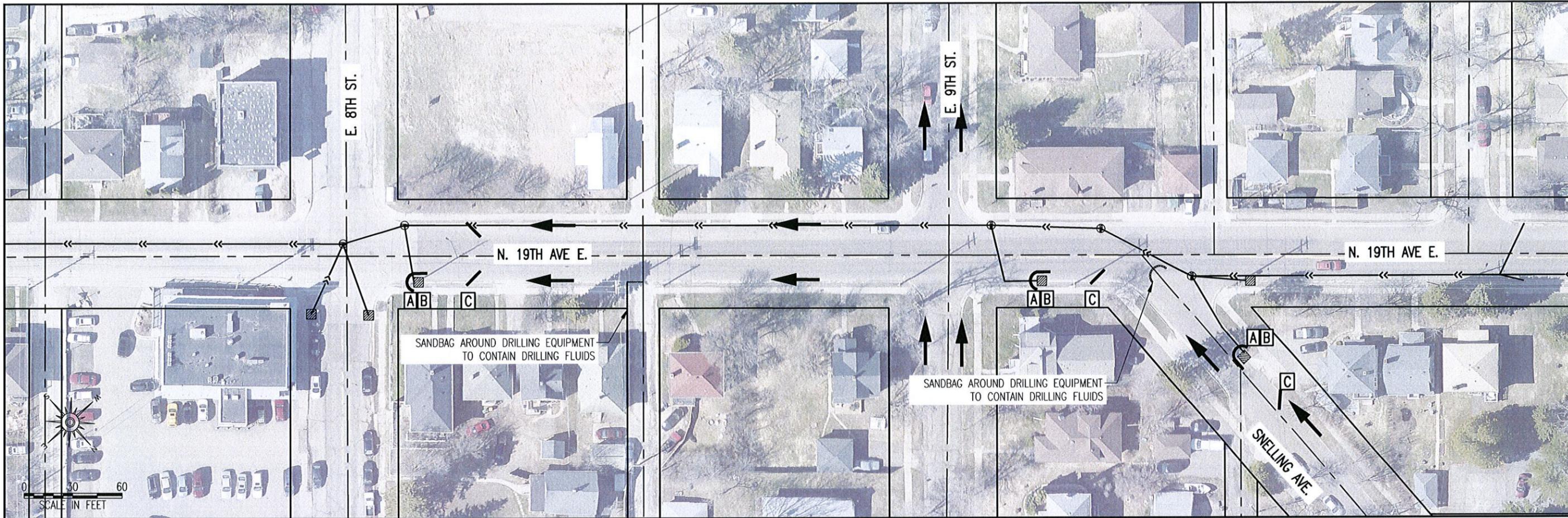


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18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.
 CITY PROJECT NO.: 1410
 STATE AID PROJECT NO.:

DRAWN BY: JRL
 EROSION CONTROL
 SHEET NO. 8 OF 44

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NOTE: SEE SHEET 5 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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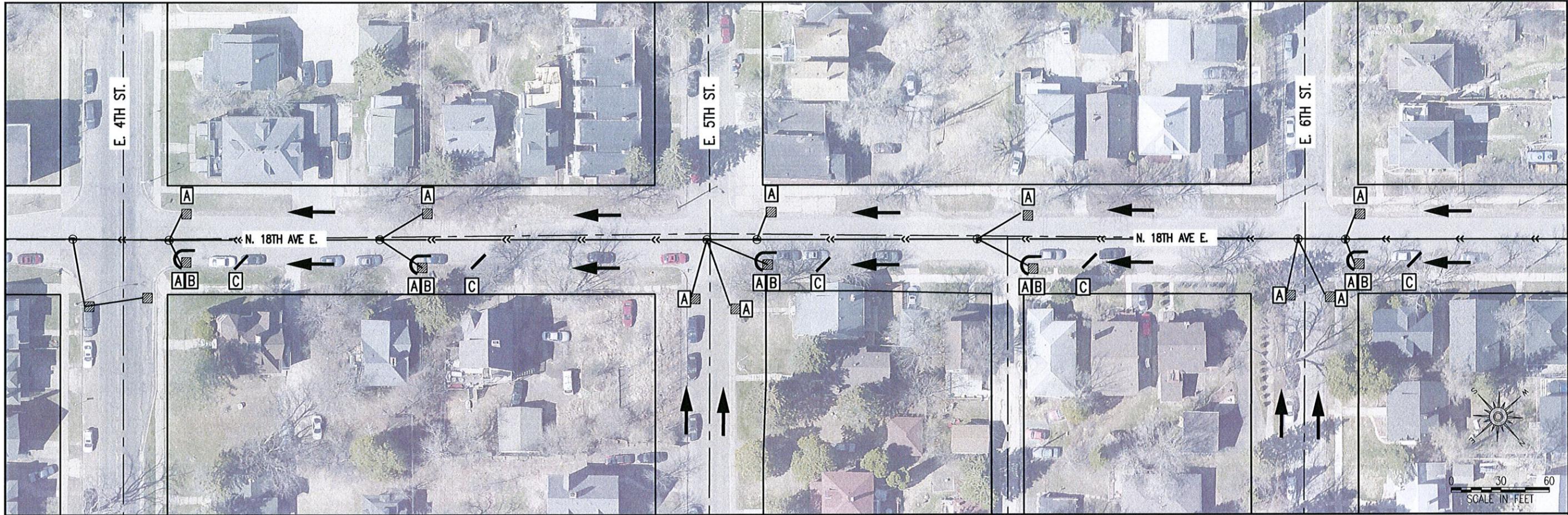
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18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.
 CITY PROJECT NO.: 1410 STATE AID PROJECT NO.:

DRAWN BY: JRL
 EROSION CONTROL
 SHEET NO. 9 OF 44



NOTE: SEE SHEET 5 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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18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

CITY PROJECT NO.: 1410

STATE AID PROJECT NO.:

DRAWN BY: JRL

EROSION CONTROL

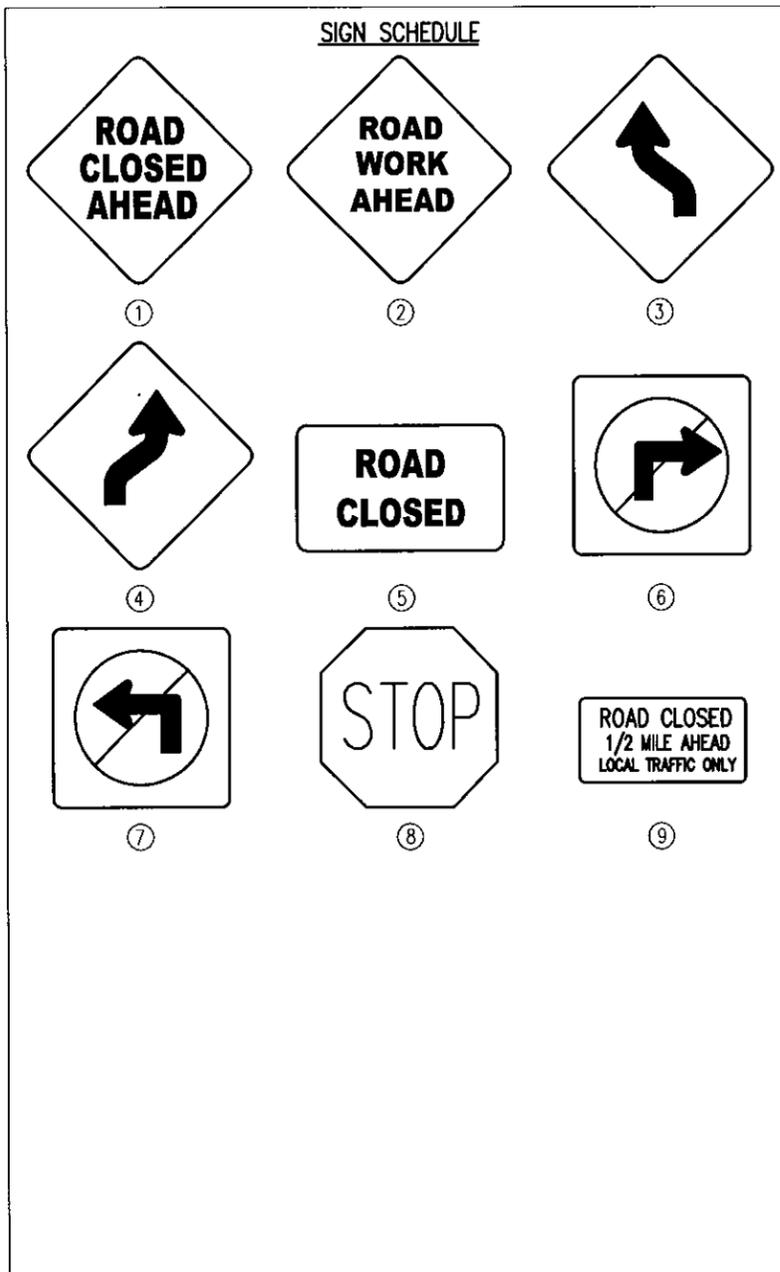
SHEET NO. 10 OF 44

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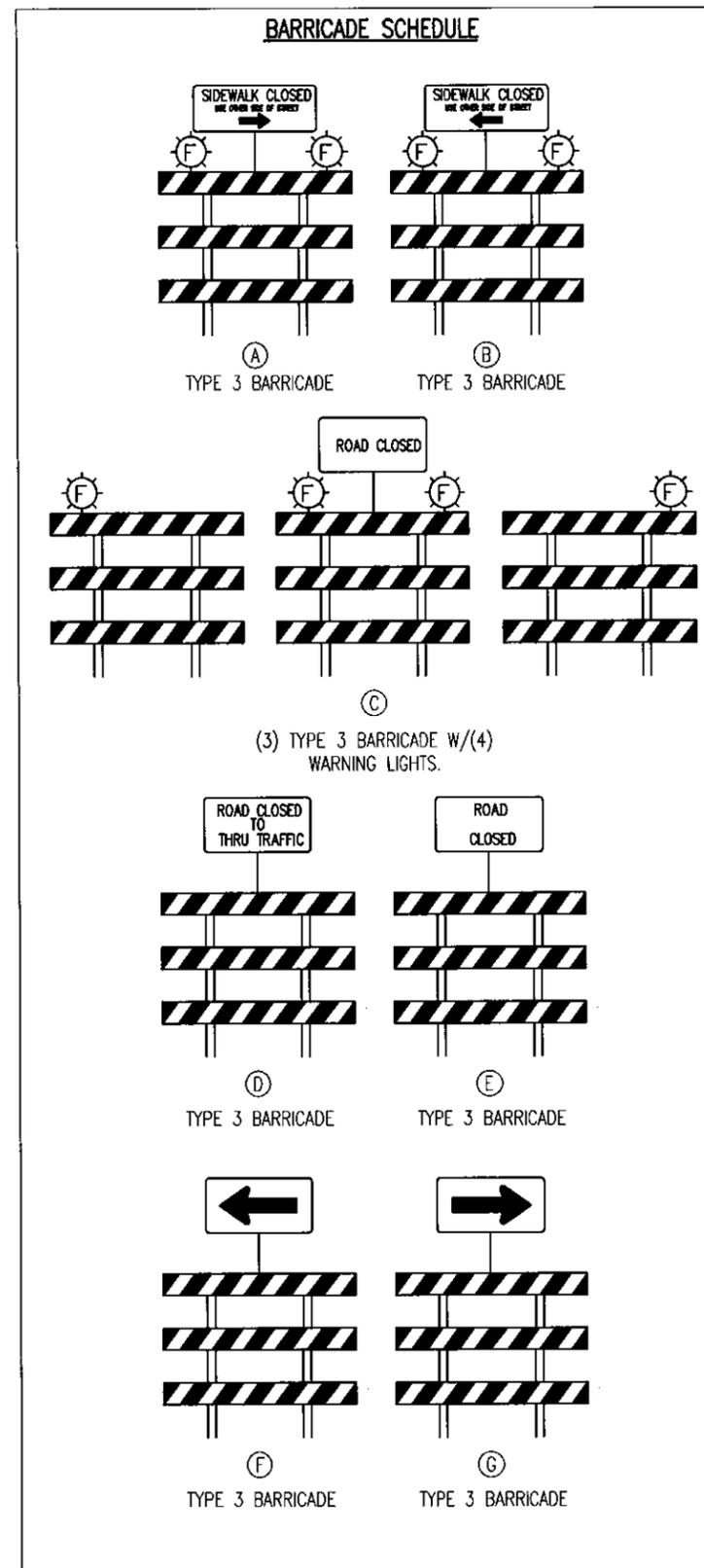
TRAFFIC CONTROL NOTES

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.
11. TYPE A (LOW INTENSITY) FLASHERS SHALL BE FURNISHED, INSTALLED AND MAINTAINED ON ALL TYPE III BARRICADES AND ADVANCED WARNING SIGNS AS DETAILED IN THIS TRAFFIC CONTROL PLAN. ADDITIONAL FLASHERS SHALL BE FURNISHED, INSTALLED AND MAINTAINED ON SIGNS, BARRICADES AND CHANNELIZERS AS NEEDED OR AS DIRECTED BY THE ENGINEER FOR TRAFFIC CONTROL THROUGH WORK ZONES WITHIN THE PROJECT LIMITS.
12. TEMPORARY LANE CLOSURES BY THE CONTRACTOR WILL BE PERMITTED DURING THOSE HOURS AND AT THOSE LOCATIONS APPROVED BY THE ENGINEER, IN ACCORDANCE WITH THE PERTINENT LAYOUTS SHOWN IN APPENDIX 'B' OF THE MMUTCD. ALL SUCH WORK RELATING TO THE CLOSURES, INCLUDING FLAGPERSONS, SHALL BE CONSTRUED TO BE INCLUDED IN THE LUMP SUM PAYMENT UNDER ITEM NO. 2563.601 (TRAFFIC CONTROL).
13. THIRD STREET SHALL REMAIN OPEN TO TRAFFIC DURING CONSTRUCTION. AGGREGATE/CRUSHED ROCK SHALL BE PLACED AS NEEDED TO MAINTAIN ADEQUATE ACCESSIBILITY. CONSTRUCTION SHALL BE STAGED TO KEEP ORIGINAL ROADWAY SURFACE INTACT AS LONG AS POSSIBLE.

SIGN SCHEDULE



BARRICADE SCHEDULE



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

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 05//17/2016

LIC. NO: 46875



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411 W. 1ST ST. STE. 211
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18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

CITY PROJECT NO.: 1410

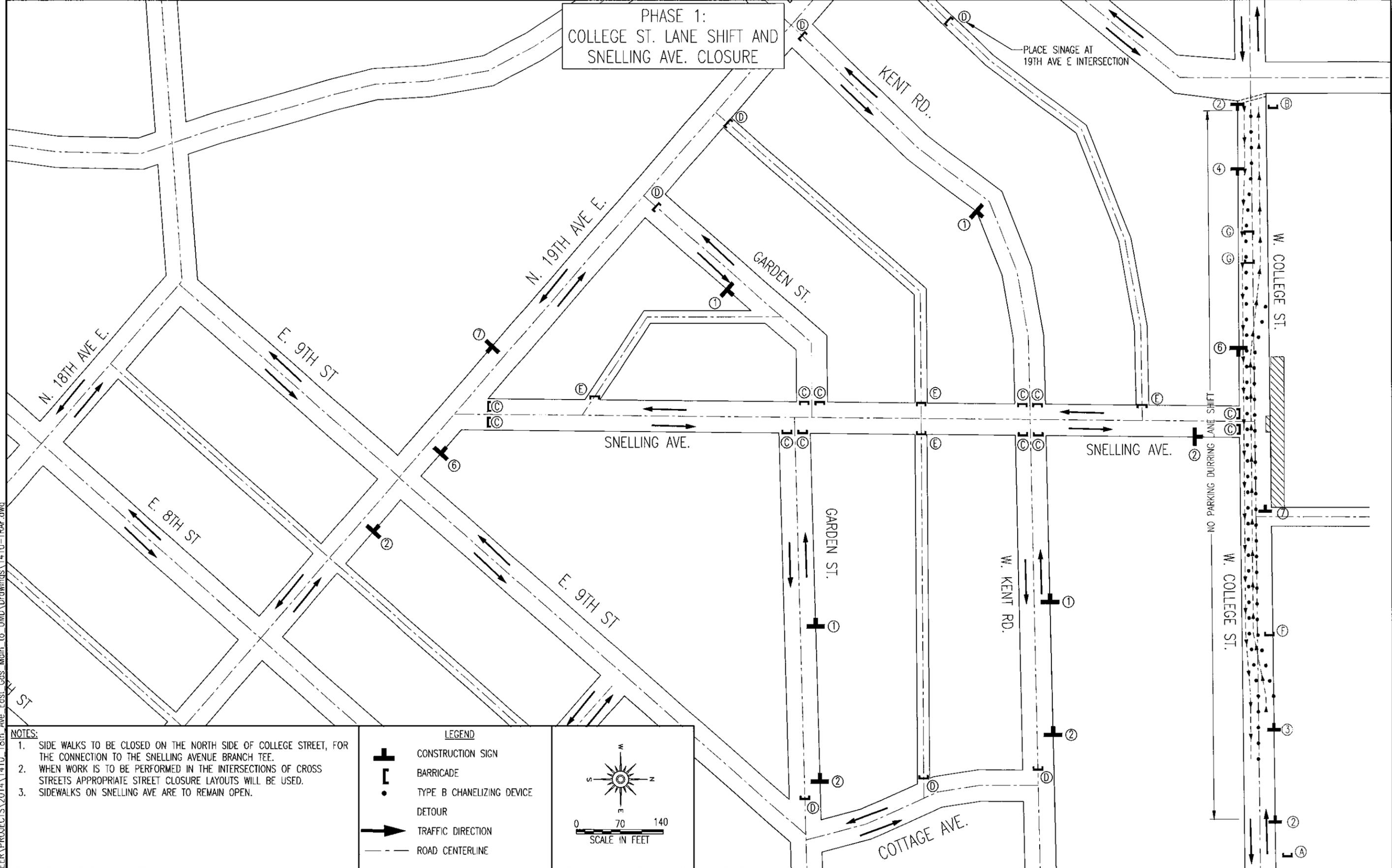
STATE AID PROJECT NO.: ----

DRAWN BY: JRL

TRAFFIC CONTROL DETAILS

SHEET NO. 11 OF 44

PHASE 1:
COLLEGE ST. LANE SHIFT AND
SNELLING AVE. CLOSURE



- NOTES:
1. SIDE WALKS TO BE CLOSED ON THE NORTH SIDE OF COLLEGE STREET, FOR THE CONNECTION TO THE SNELLING AVENUE BRANCH TEE.
 2. WHEN WORK IS TO BE PERFORMED IN THE INTERSECTIONS OF CROSS STREETS APPROPRIATE STREET CLOSURE LAYOUTS WILL BE USED.
 3. SIDEWALKS ON SNELLING AVE ARE TO REMAIN OPEN.

LEGEND

- CONSTRUCTION SIGN
- BARRICADE
- TYPE B CHANNELIZING DEVICE
- DETOUR
- TRAFFIC DIRECTION
- ROAD CENTERLINE

SCALE IN FEET
0 70 140

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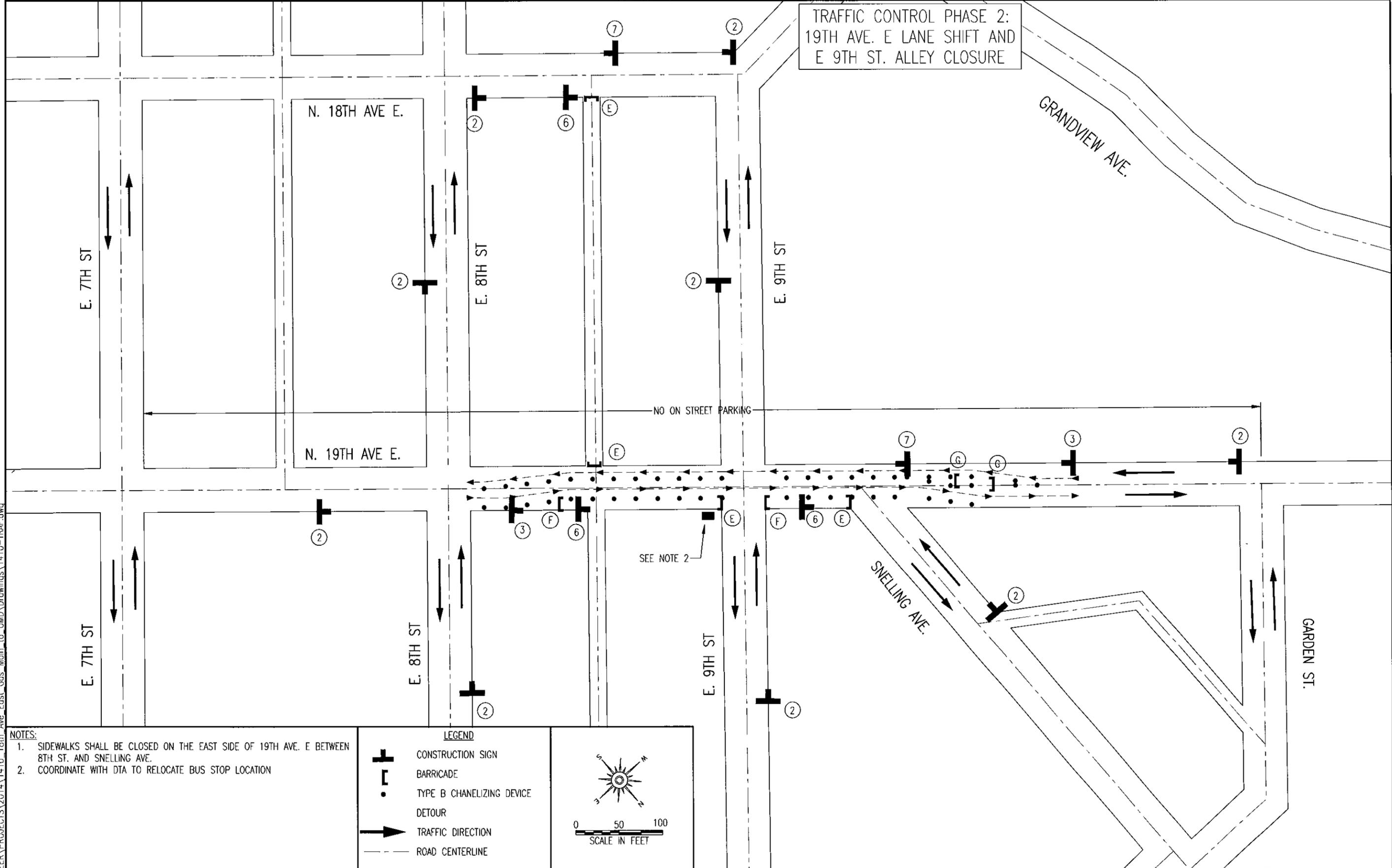
18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.
CITY PROJECT NO.: 1410 STATE AID PROJECT NO.:

DRAWN BY: JRL
TRAFFIC CONTROL PLAN - PHASE 1
SHEET NO. 12 OF 44

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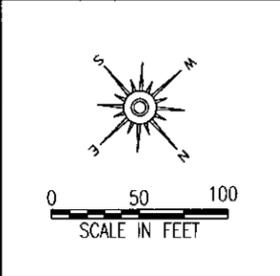
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TRAFFIC CONTROL PHASE 2:
19TH AVE. E LANE SHIFT AND
E 9TH ST. ALLEY CLOSURE



- NOTES:**
1. SIDEWALKS SHALL BE CLOSED ON THE EAST SIDE OF 19TH AVE. E BETWEEN 8TH ST. AND SNELLING AVE.
 2. COORDINATE WITH DTA TO RELOCATE BUS STOP LOCATION

- LEGEND**
- CONSTRUCTION SIGN
 - BARRICADE
 - TYPE B CHANELIZING DEVICE
 - DETOUR
 - TRAFFIC DIRECTION
 - ROAD CENTERLINE



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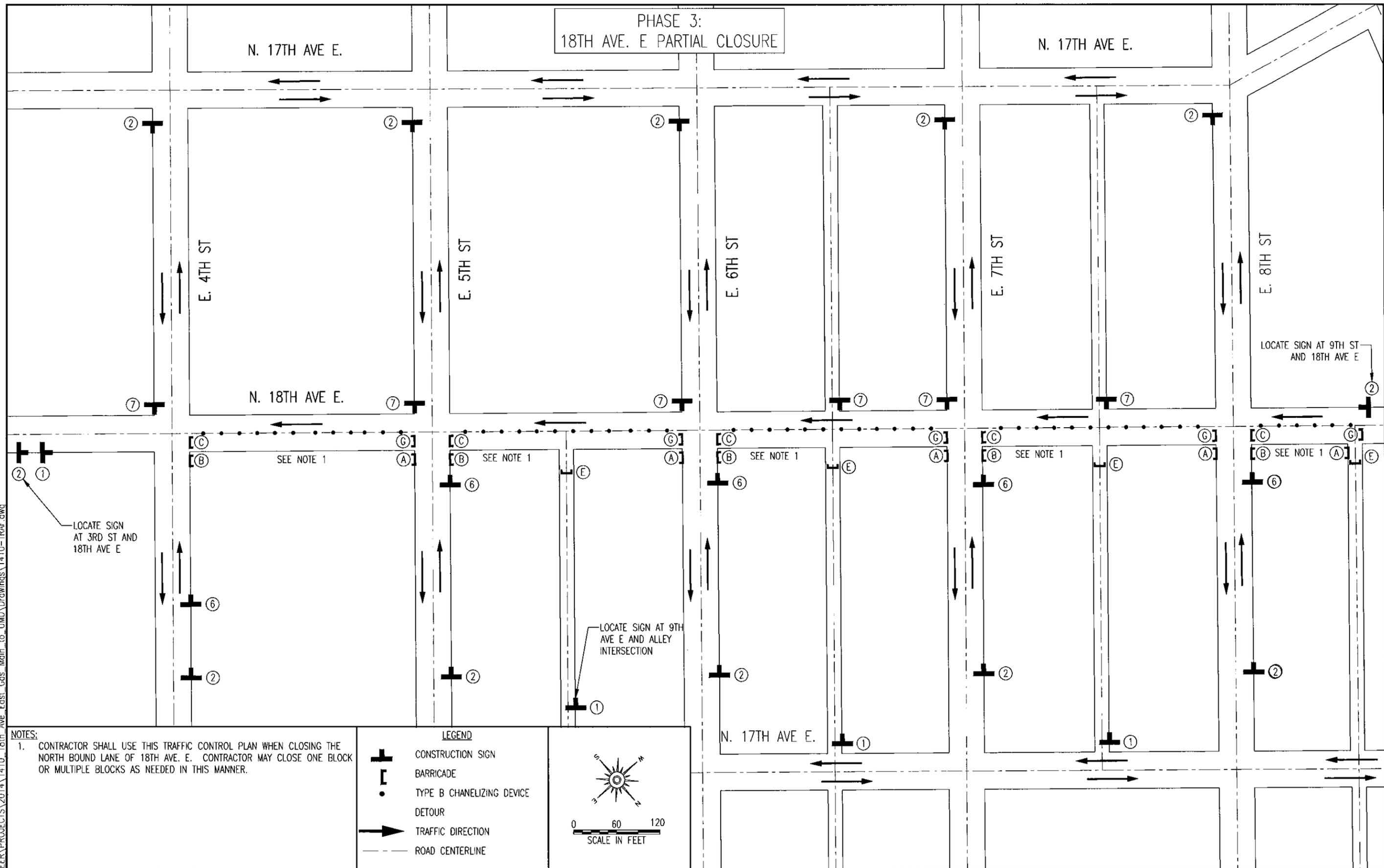
18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

CITY PROJECT NO.: 1410 STATE AID PROJECT NO.:

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TRAFFIC CONTROL PLAN - PHASE 2
SHEET NO. 13 OF 44

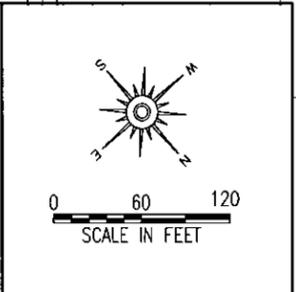
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PHASE 3:
18TH AVE. E PARTIAL CLOSURE



NOTES:
1. CONTRACTOR SHALL USE THIS TRAFFIC CONTROL PLAN WHEN CLOSING THE NORTH BOUND LANE OF 18TH AVE. E. CONTRACTOR MAY CLOSE ONE BLOCK OR MULTIPLE BLOCKS AS NEEDED IN THIS MANNER.

LEGEND	
	CONSTRUCTION SIGN
	BARRICADE
	TYPE B CHANELIZING DEVICE
	DETOUR
	TRAFFIC DIRECTION
	ROAD CENTERLINE



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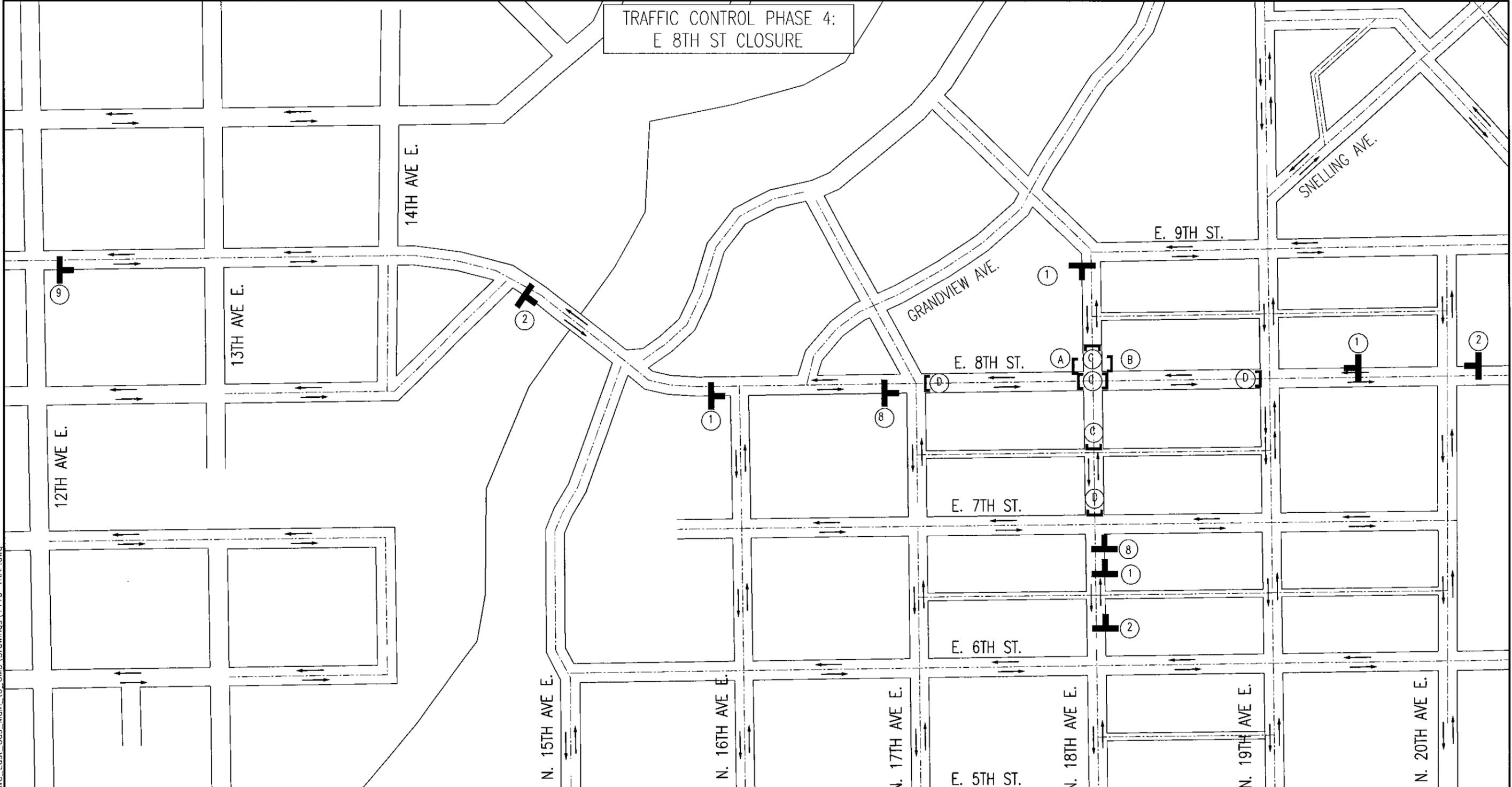
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411 W. 1ST ST. STE. 211
DULUTH, MN 55802

18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.
CITY PROJECT NO.: 1410
STATE AID PROJECT NO.:

DRAWN BY: JRL
TRAFFIC CONTROL PLAN - PHASE 3
SHEET NO. 14 OF 44

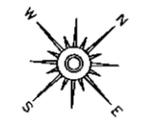
TRAFFIC CONTROL PHASE 4:
E 8TH ST CLOSURE



- NOTES:**
1. THIS TRAFFIC CONTROL LAYOUT SHALL BE USED CONCURRENTLY WITH THE 18TH AVE. E TRAFFIC CONTROL PLAN TO CLOSE E 8TH ST. WHEN INSTALLING THE GAS MAIN THROUGH THE 18TH AVE. E AND E 8TH ST. INTERSECTION. BASED UPON THE SCHEDULE OF OTHER NEARBY STREET CLOSURES, THE ENGINEER MAY REQUEST ADDITIONAL DETOUR SIGNAGE AS A CHANGE ORDER TO THE PROJECT.
 2. CONTRACTOR SHALL PROVIDE TEMPORARY GRAVEL SURFACING ON 8TH ST THEN REPAIR HALF THE ROAD AT A TIME WHILE DIVERTING TRAFFIC TO THE OPEN SIDE.

LEGEND

-  CONSTRUCTION SIGN
-  BARRICADE
-  TYPE B CHANELIZING DEVICE
-  DETOUR
-  TRAFFIC DIRECTION
-  ROAD CENTERLINE



0 175 350
SCALE IN FEET

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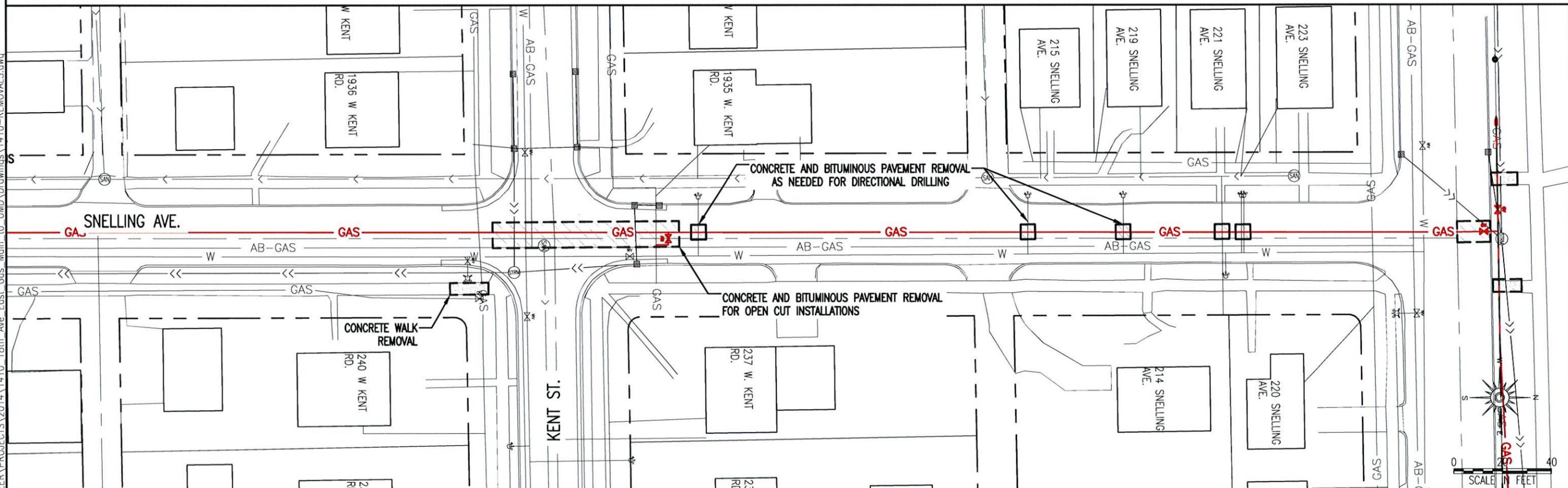
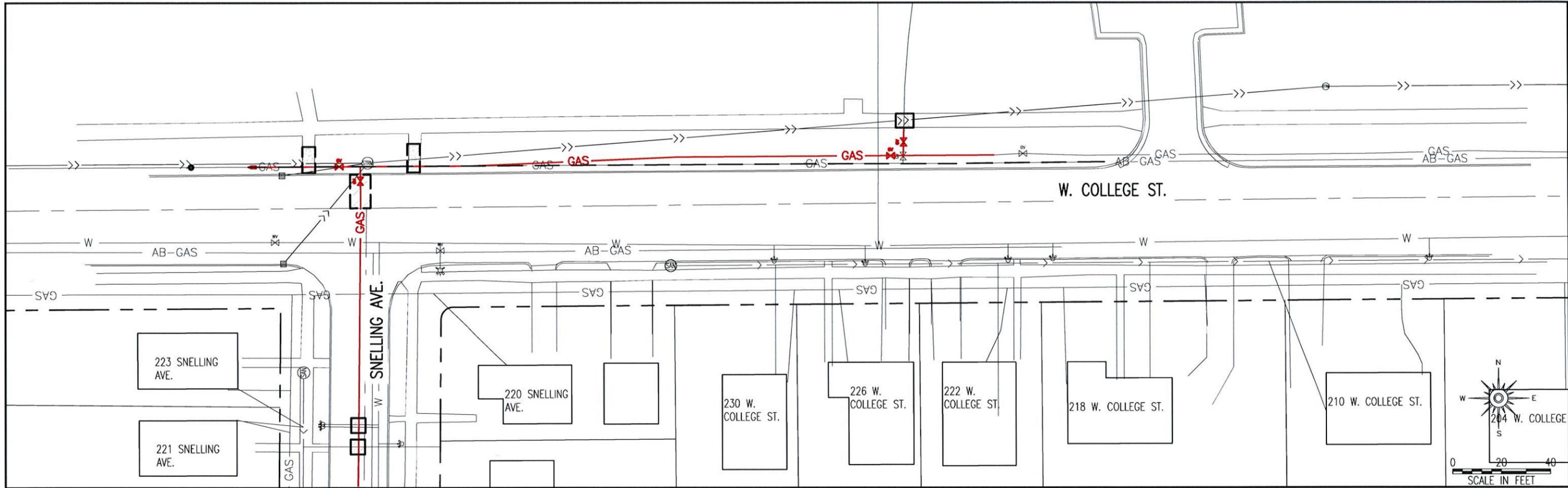
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CITY PROJECT NO.: 1410 STATE AID PROJECT NO.:

DRAWN BY: JRL
TRAFFIC CONTROL PLAN - PHASE 4
SHEET NO. 15 OF 44

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MINNESOTA

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

18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

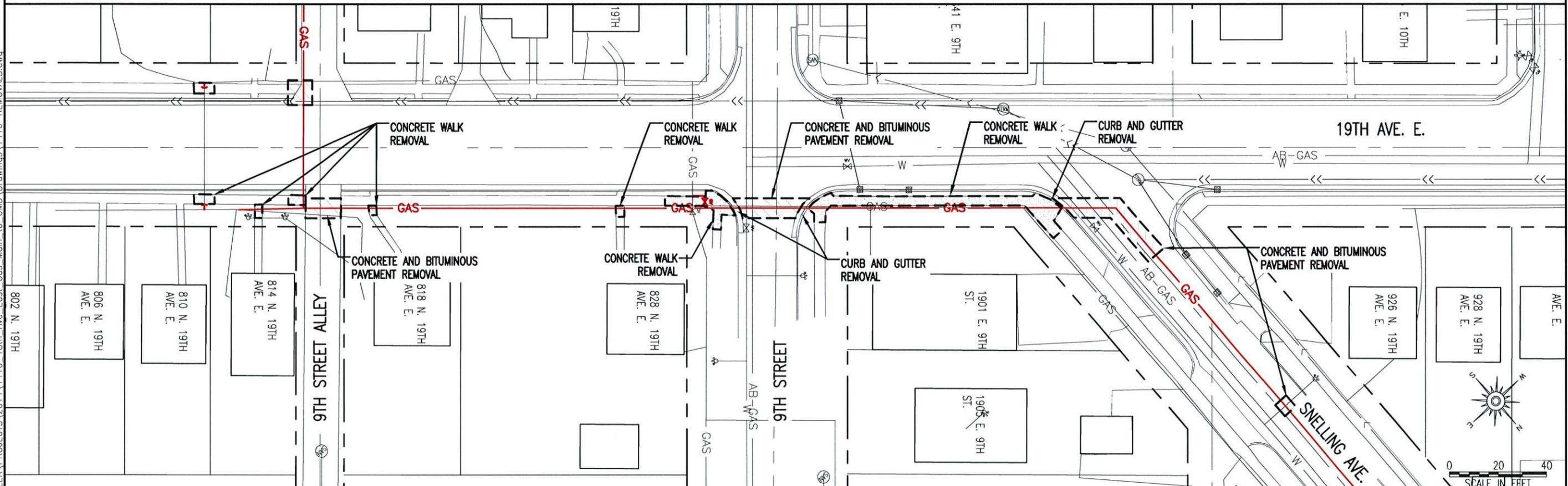
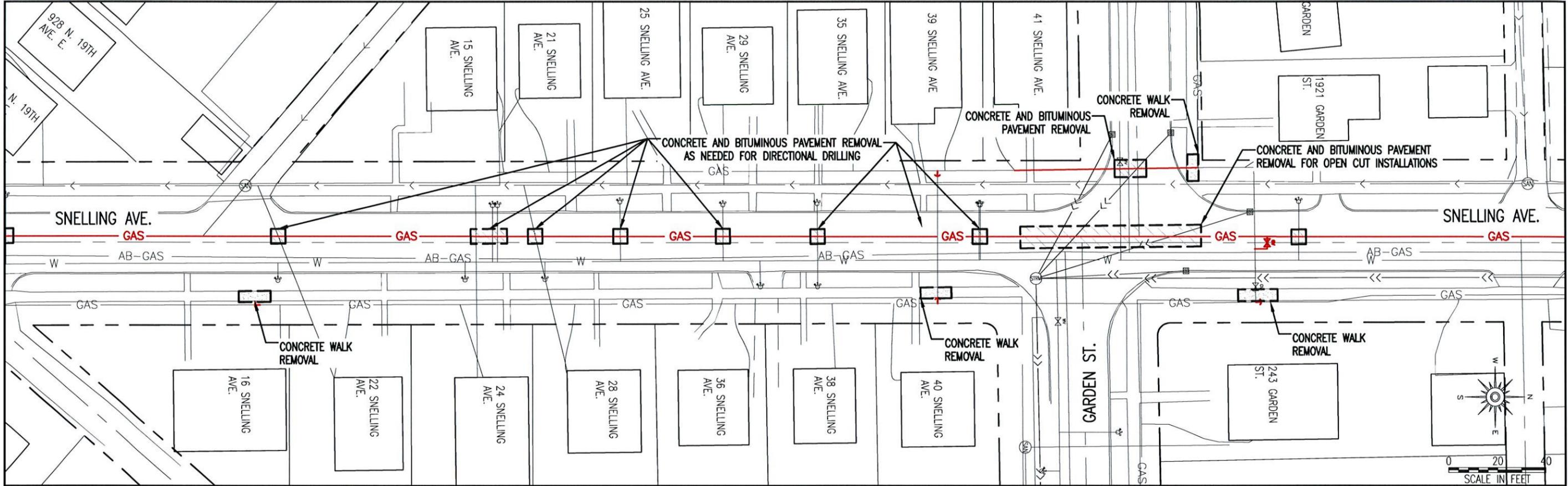
CITY PROJECT NO.: 1410

STATE AID PROJECT NO.:

DRAWN BY: JRL

REMOVALS

SHEET NO. 17 OF 44



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.*

DATE: 05//17/2016
 HOWARD D. SMITH, P.E.
 TYPE NAME
 LIC. NO.: 46875

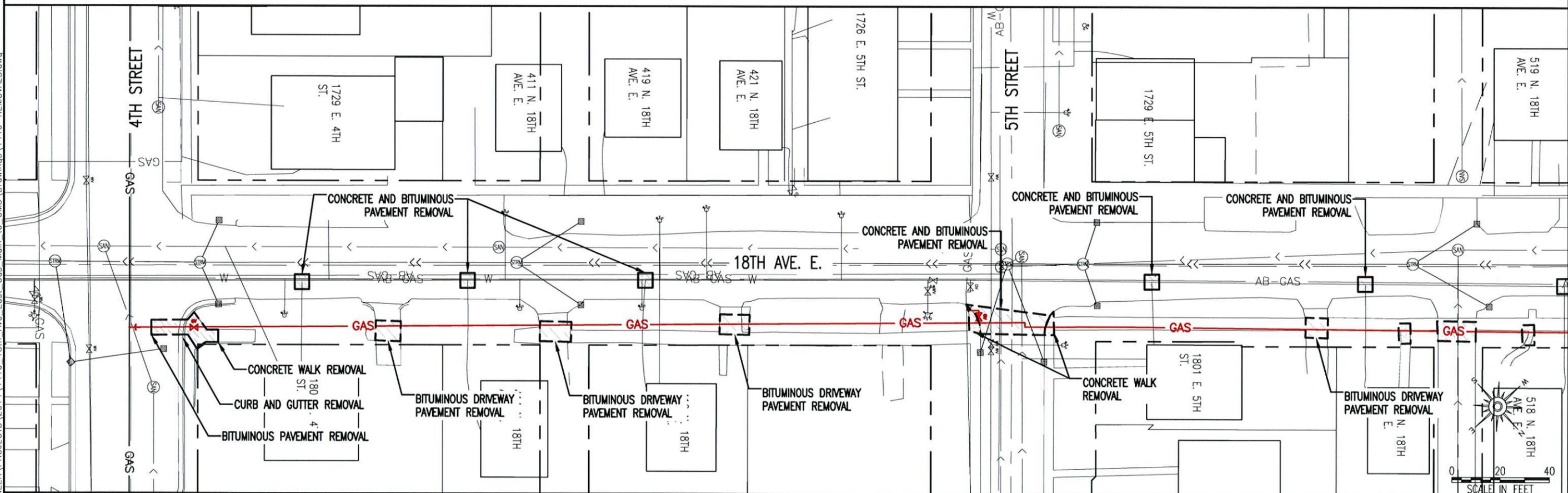
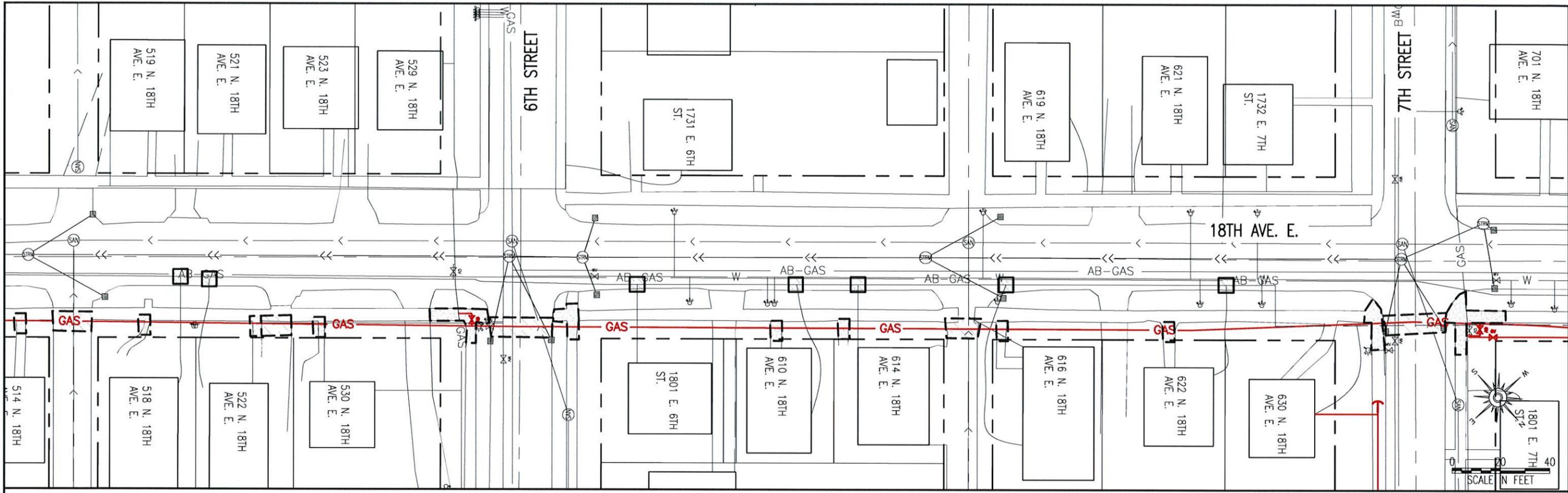


CITY OF DULUTH
 ENGINEERING DIVISION
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18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.
 CITY PROJECT NO.: 1410
 STATE AID PROJECT NO.:

DRAWN BY: JRL
 REMOVALS
 SHEET NO. 18 OF 44

I:\PWU\ENGINEER\PROJECTS\2014\1410_18th_Ave_East_Gas_Main_to_UMD\Drawings\1410-REMOVALS.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.
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ENGINEERING DIVISION
411 W. 1ST ST. STE. 211
DULUTH, MN 55802

18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

CITY PROJECT NO.: 1410

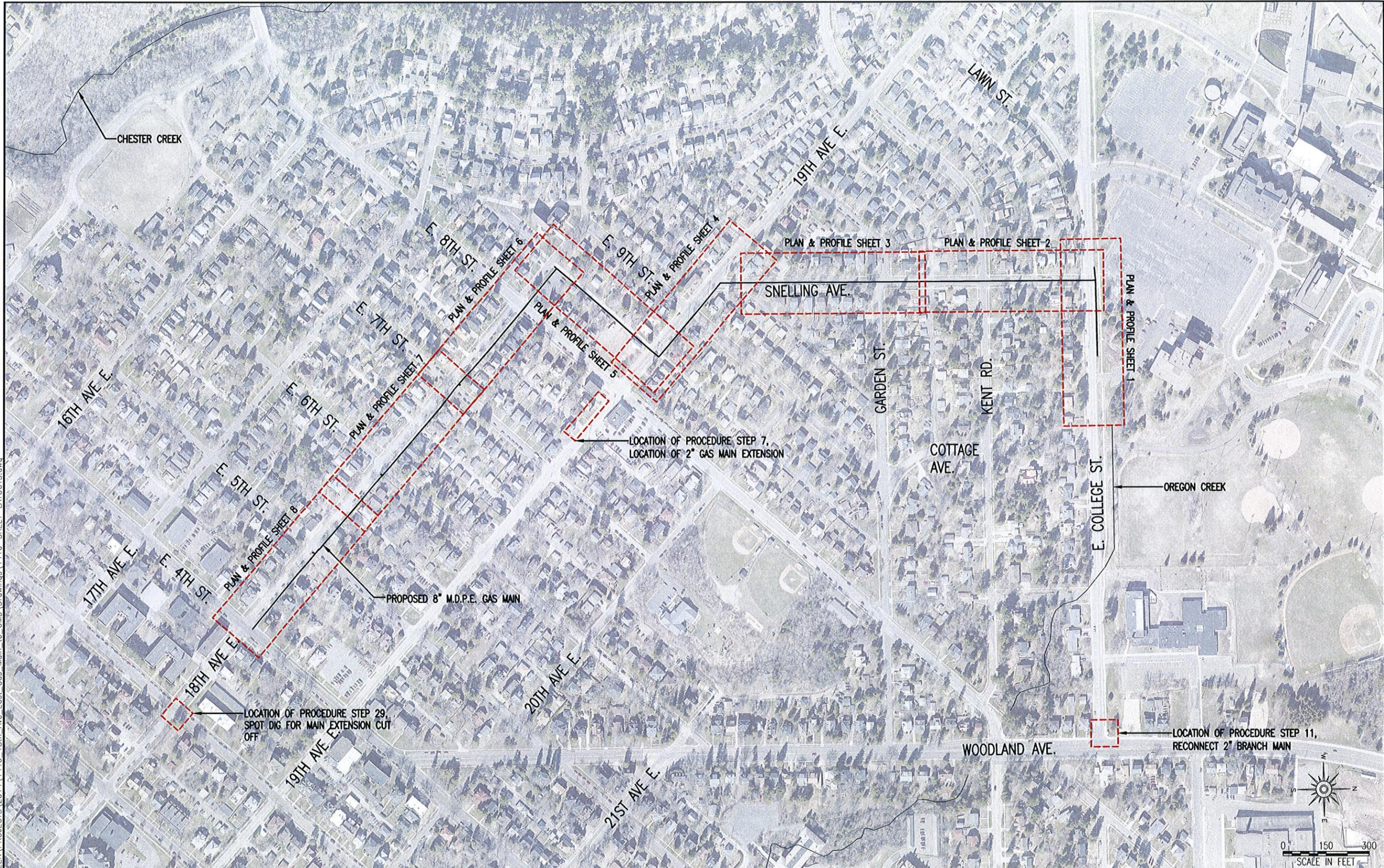
STATE AID PROJECT NO.:

DRAWN BY: JRL

REMOVALS

SHEET NO. 20 OF 44

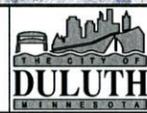
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I:\PWU\ENGINEER\PROJECTS\2014\1410 18th Ave East Gas Main to UMD\Drawings\1410-SHEET-LAYOUTS.dwg

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

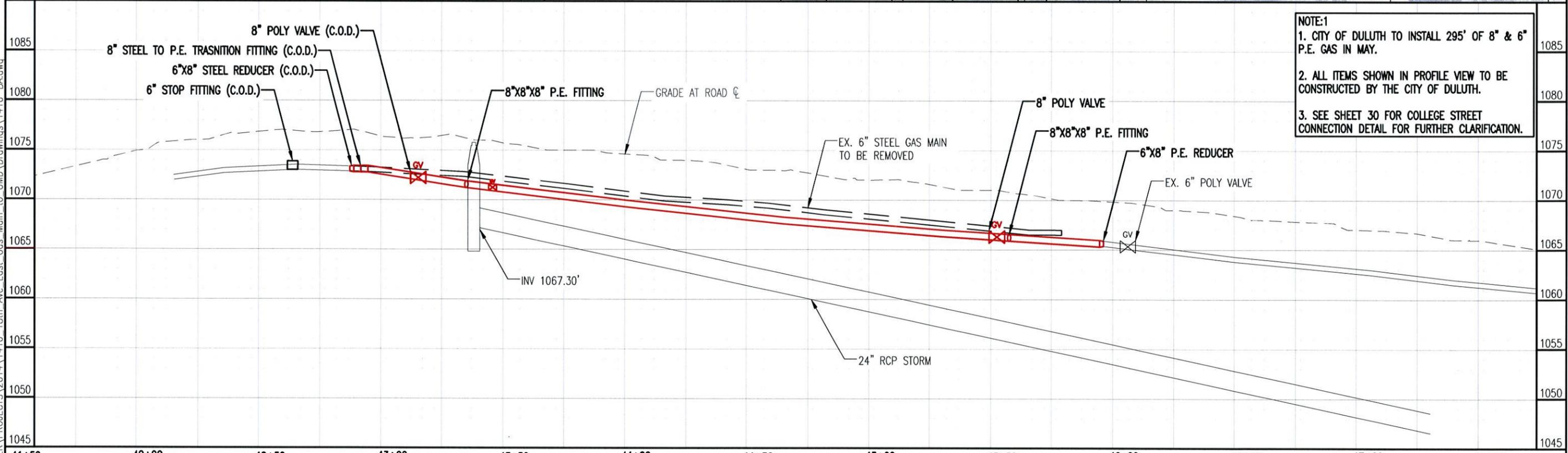
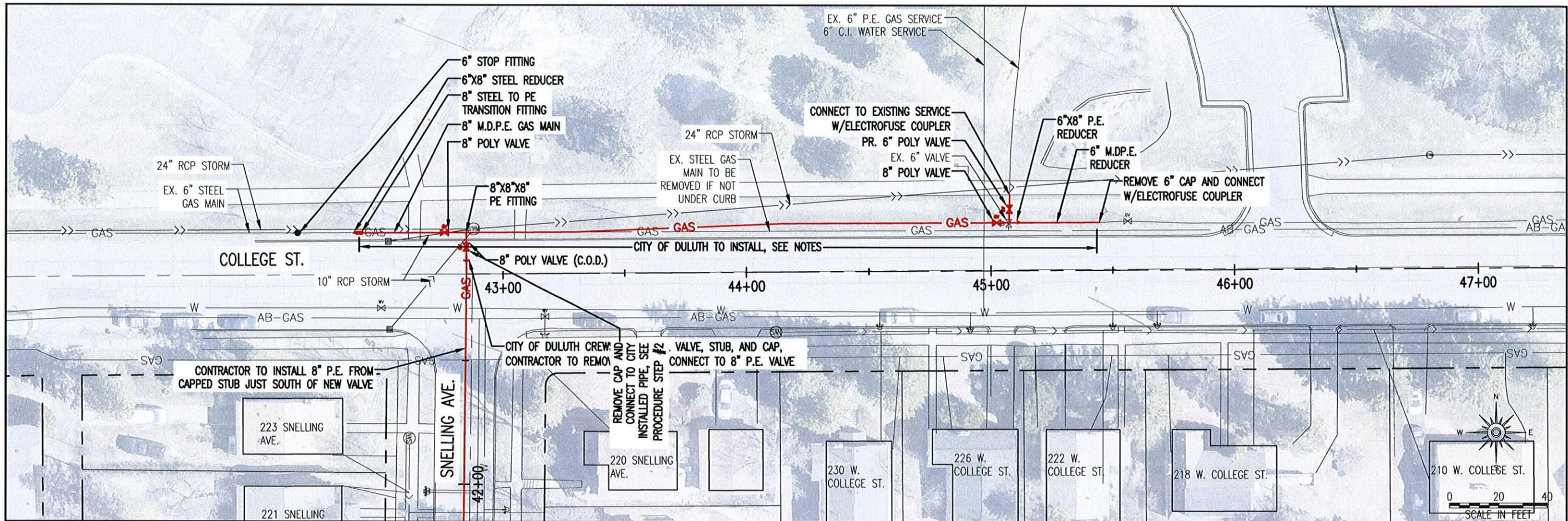
DATE: 05//17/2016
 LIC. NO.: 46875



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

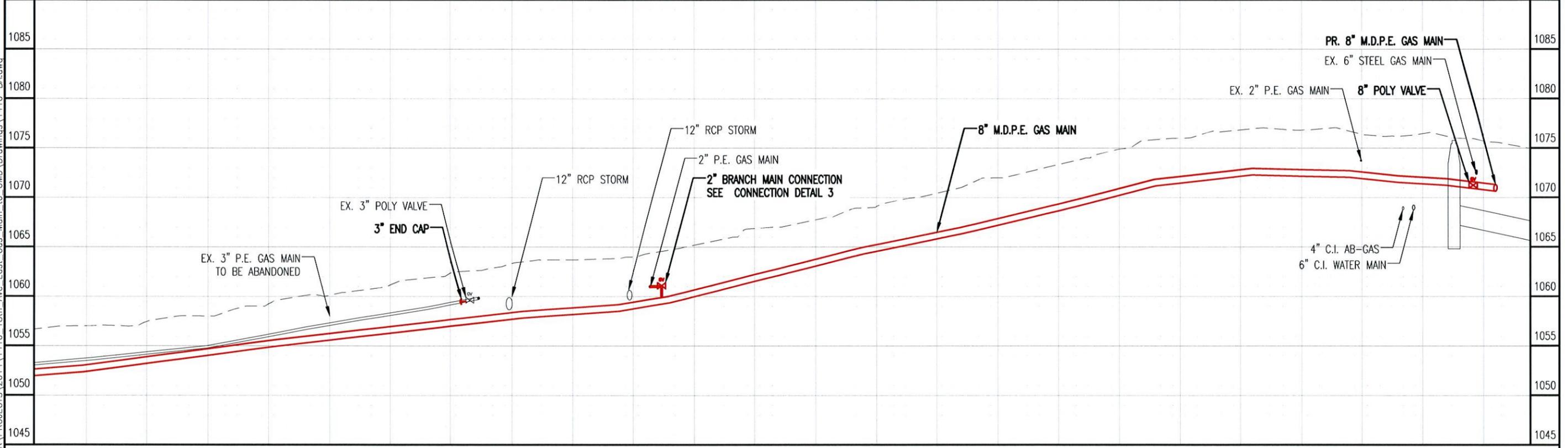
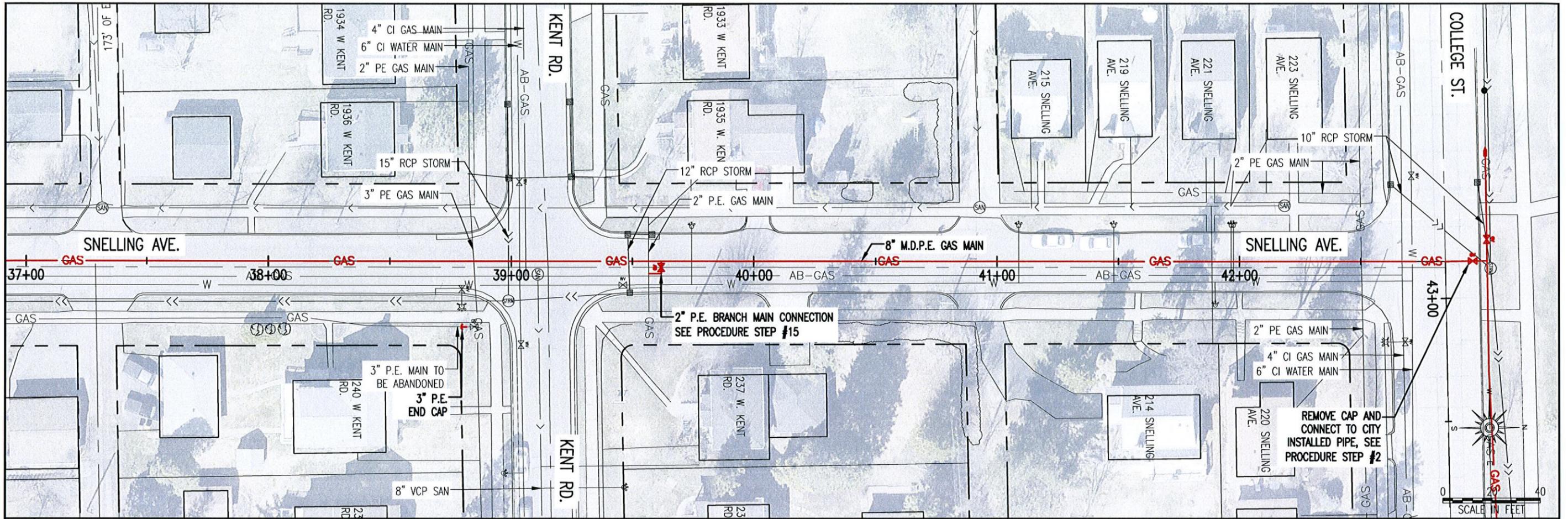
18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.
 CITY PROJECT NO.: 1410
 STATE AID PROJECT NO.: ----

DRAWN BY: JRL
 SHEET LAYOUT
 SHEET NO. 21 OF 44

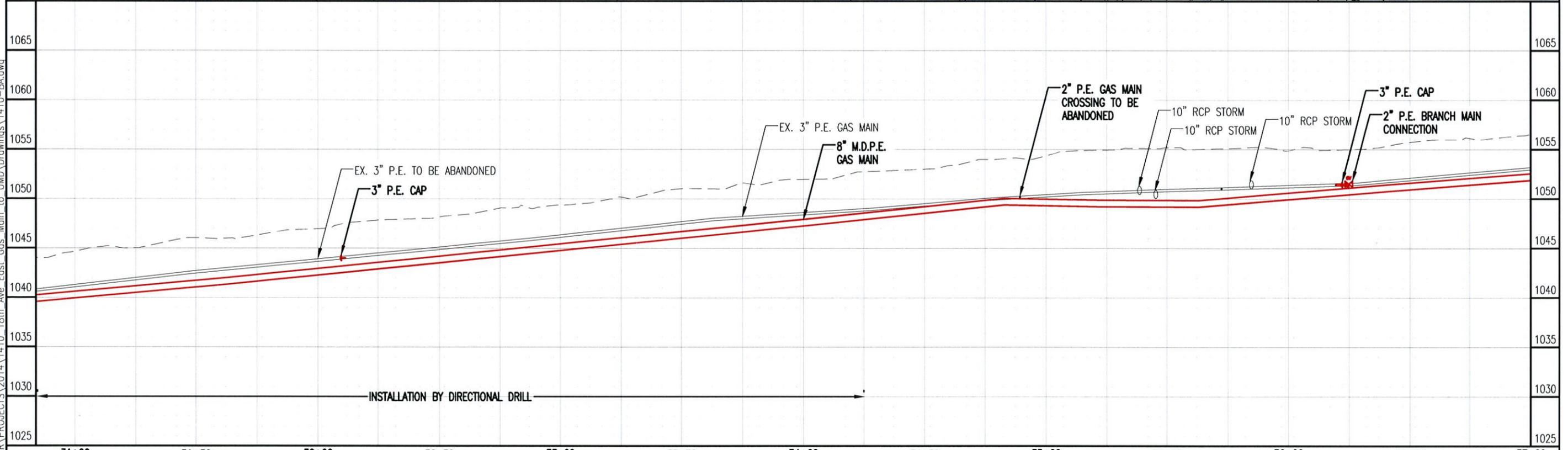
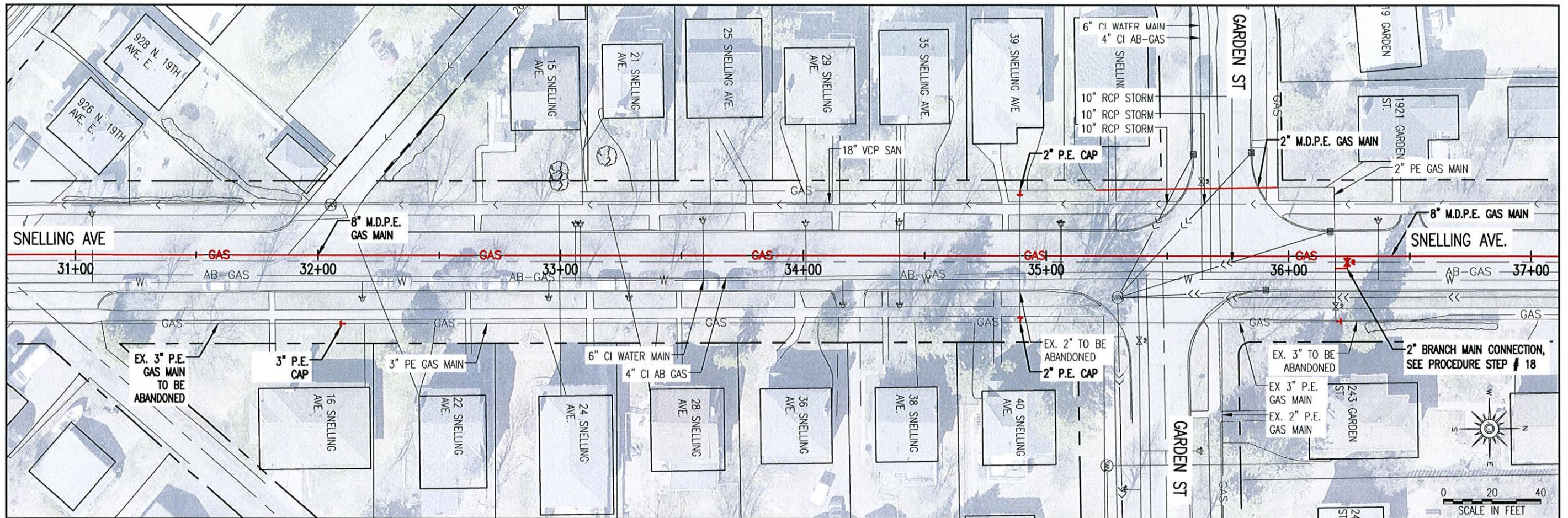


NOTE:1
 1. CITY OF DULUTH TO INSTALL 295' OF 8" & 6" P.E. GAS IN MAY.
 2. ALL ITEMS SHOWN IN PROFILE VIEW TO BE CONSTRUCTED BY THE CITY OF DULUTH.
 3. SEE SHEET 30 FOR COLLEGE STREET CONNECTION DETAIL FOR FURTHER CLARIFICATION.

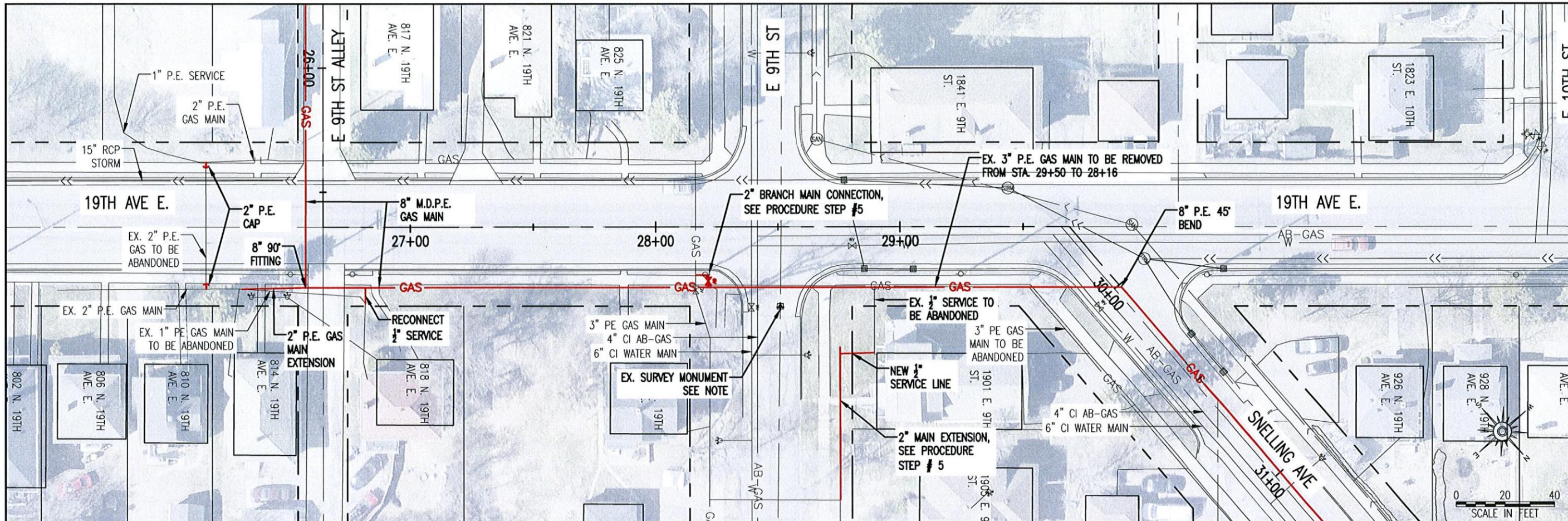
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		DATE: 05//17/2016	CITY OF DULUTH ENGINEERING DIVISION 411 W. 1ST ST. STE. 211 DULUTH, MN 55802	18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.		DRAWN BY: JRL	
SIGNATURE: <i>Howard Smith, P.E.</i>		LIC. NO: 46875		CITY PROJECT NO.: 1410	STATE AID PROJECT NO.:	PLAN & PROFILE	



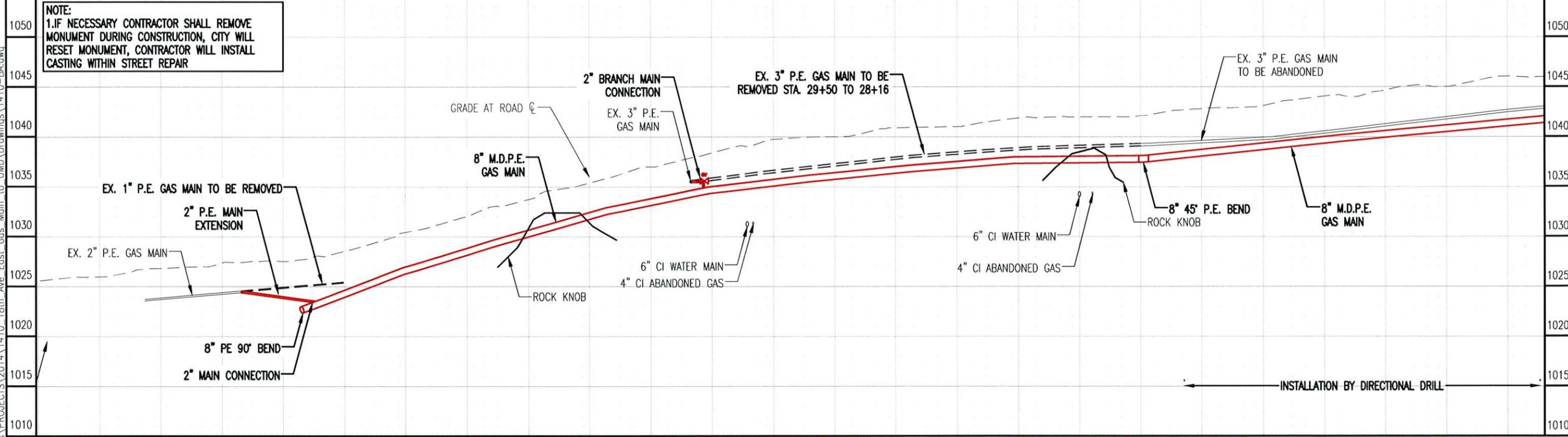
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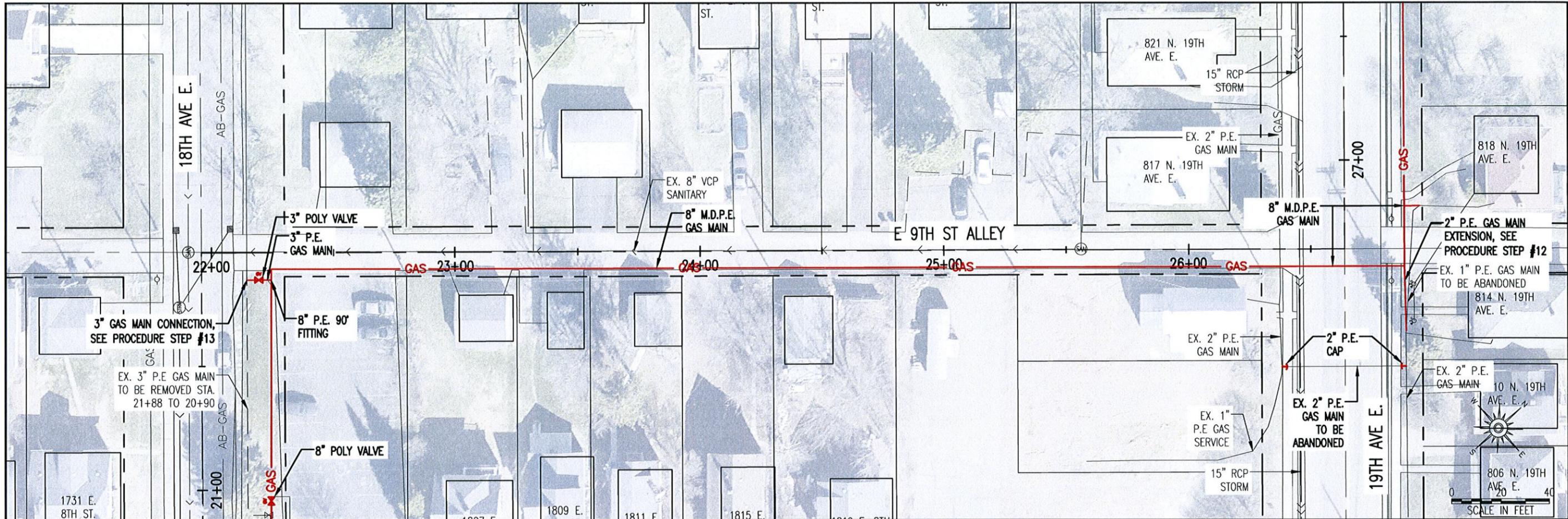
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NOTE:
 1. IF NECESSARY CONTRACTOR SHALL REMOVE MONUMENT DURING CONSTRUCTION, CITY WILL RESET MONUMENT, CONTRACTOR WILL INSTALL CASTING WITHIN STREET REPAIR

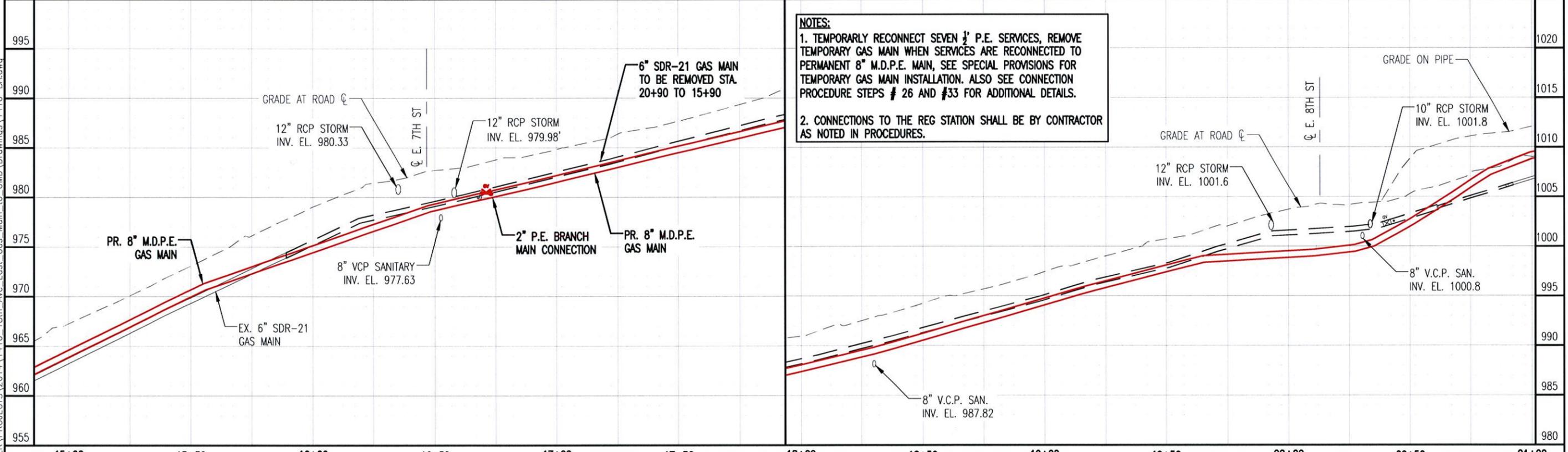
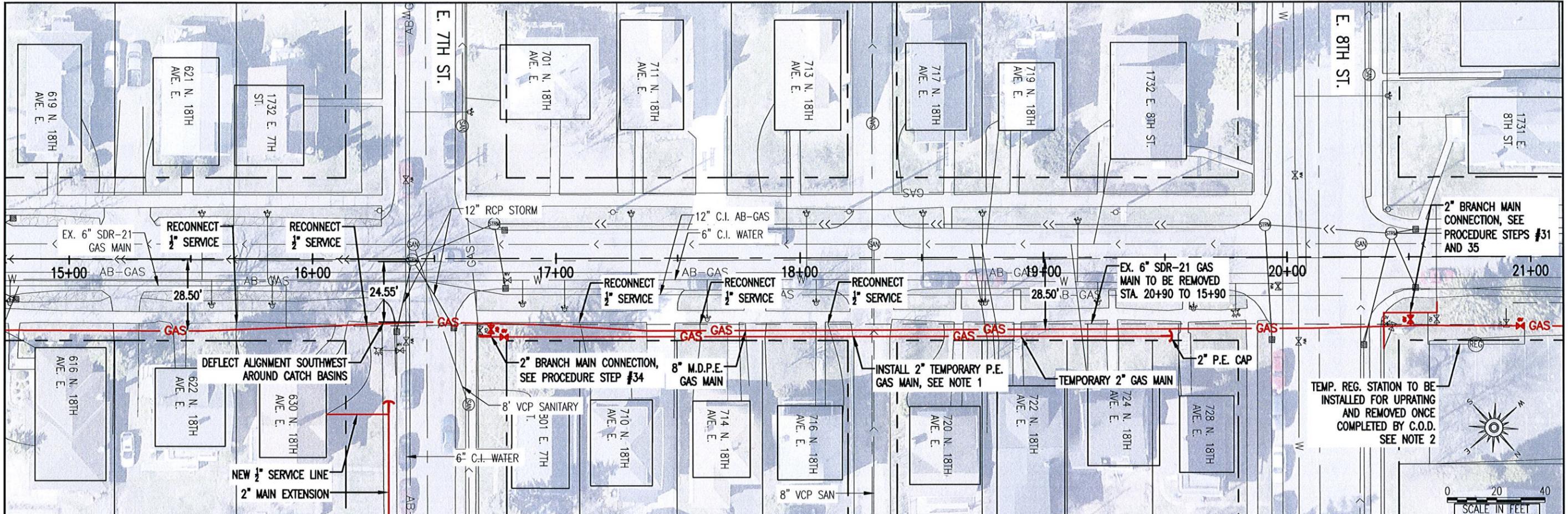


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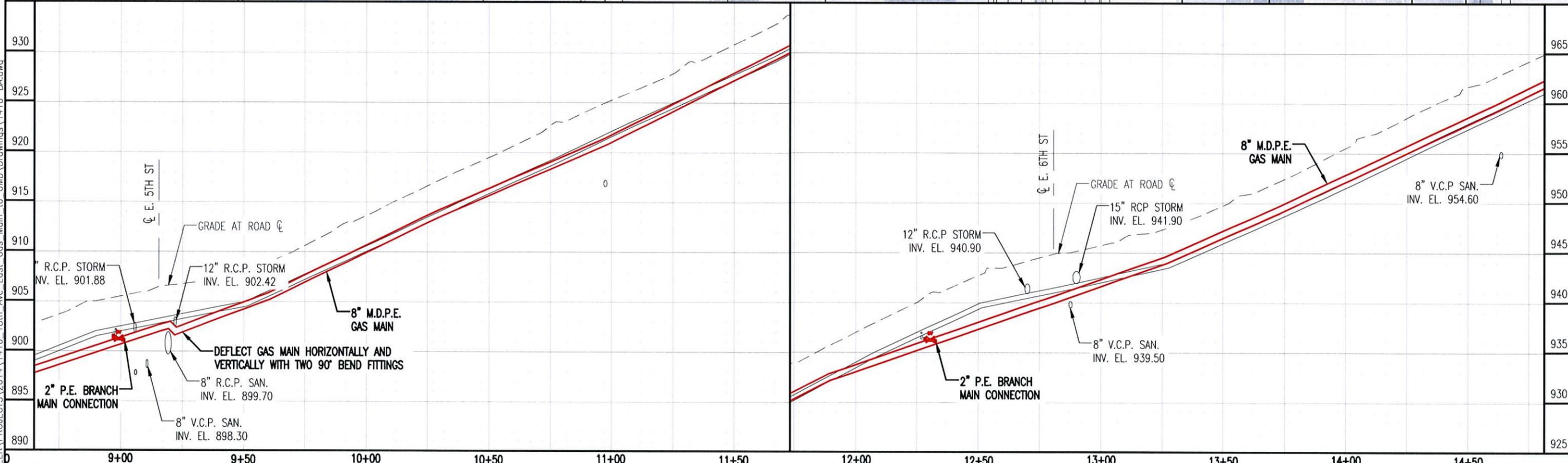
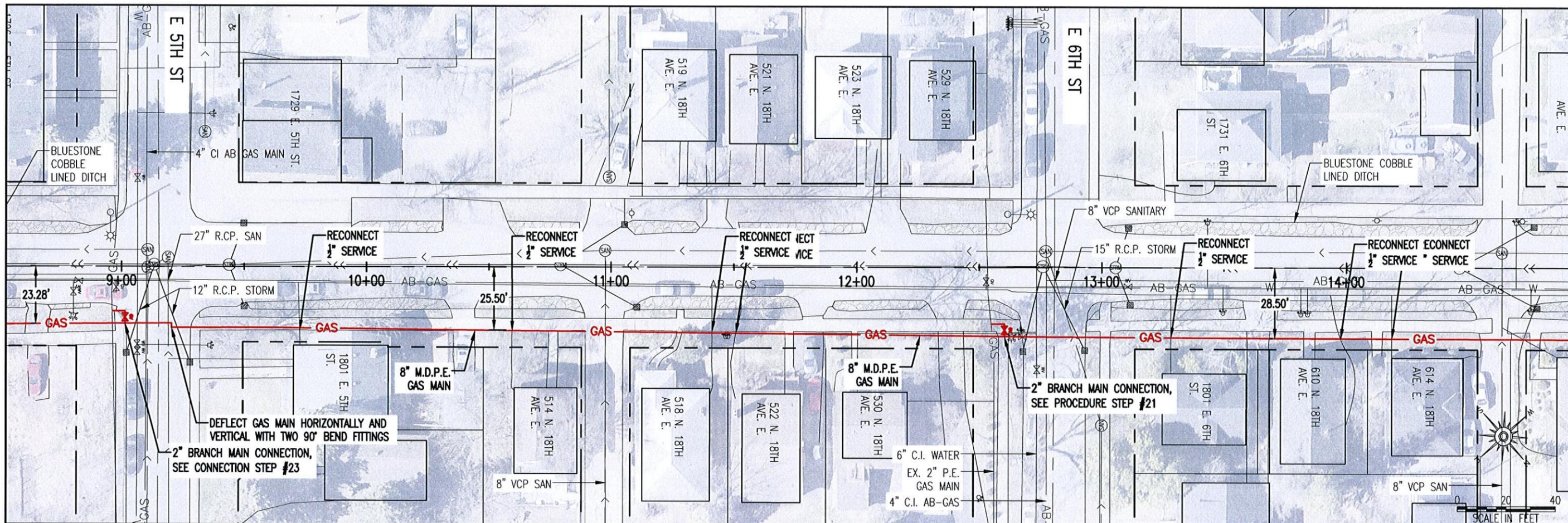
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I:\PW\ENGINEER\PROJECTS\2014\18th Ave. East Gas Main to UMD\Drawings\1410-BA.dwg



NOTES:

1. TEMPORARILY RECONNECT SEVEN 1/2\"/>
2. CONNECTIONS TO THE REG STATION SHALL BE BY CONTRACTOR AS NOTED IN PROCEDURES.



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 Smith, P.E.*

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 05//17/2016

LIC. NO.: 46875



CITY OF DULUTH
ENGINEERING DIVISION
411 W. 1ST ST. STE. 211
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18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

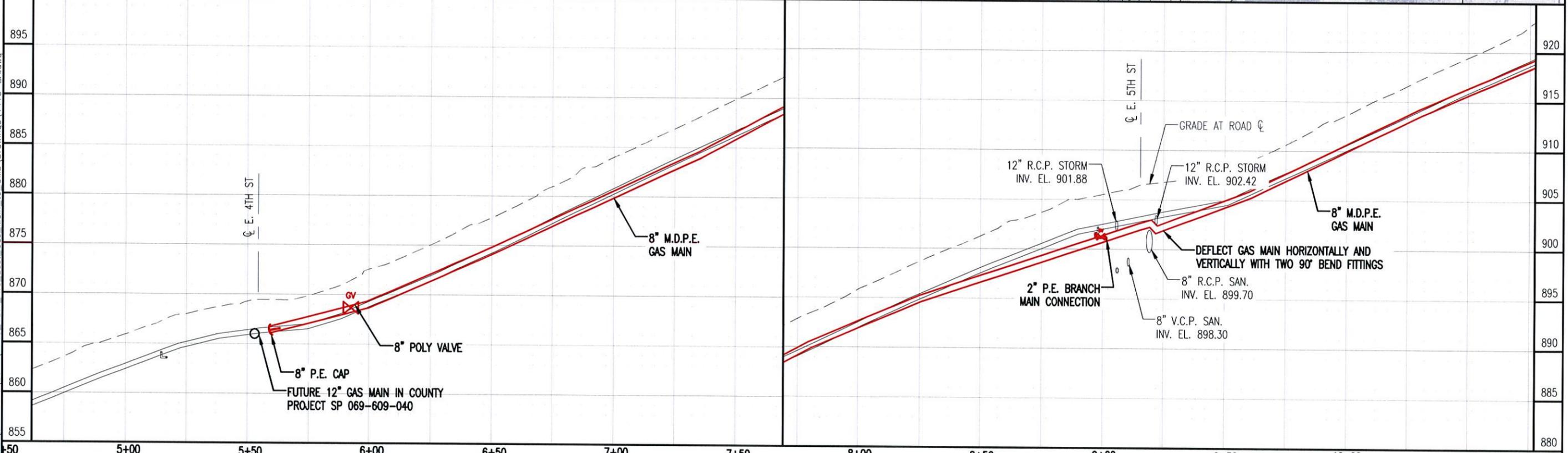
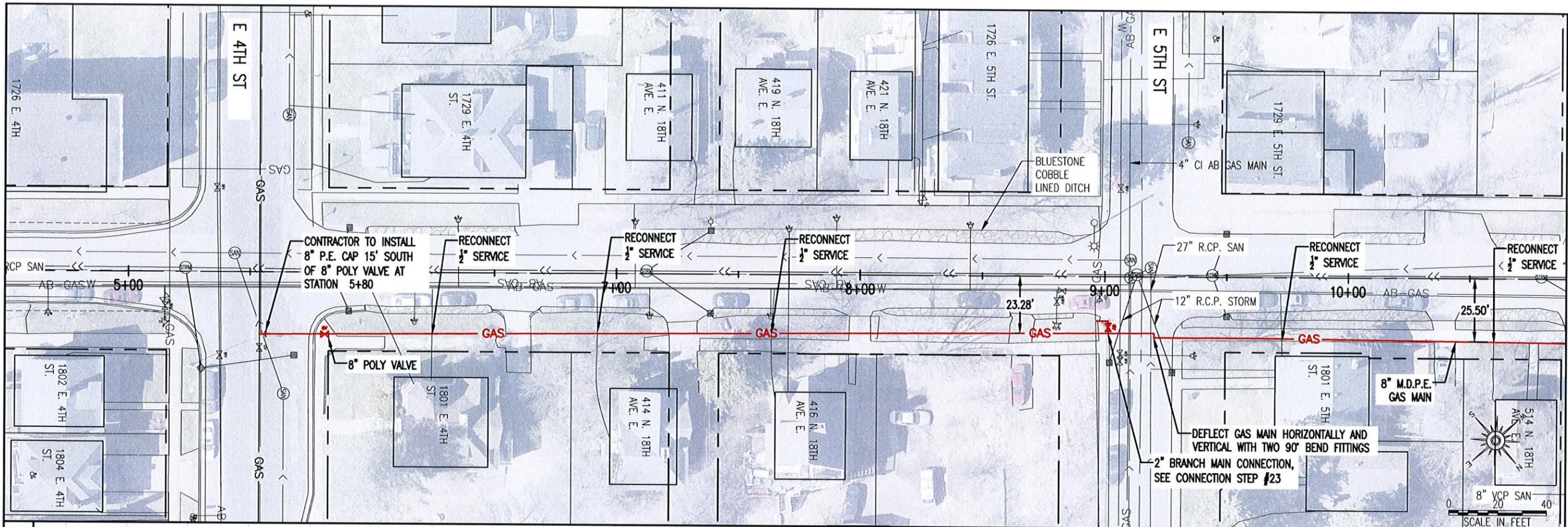
CITY PROJECT NO.: 1410

STATE AID PROJECT NO.:

DRAWN BY: JRL

PLAN & PROFILE

SHEET NO. 28 OF 44



I:\PW\ENGINEER\PROJECTS\2014\1410_18th Ave. East_Gas_Main to UMD\Drawings\1410-BA.dwg

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 HOWARD D. SMITH, P.E.
 TYPE NAME

DATE: 05/17/2016
 LIC. NO.: 46875

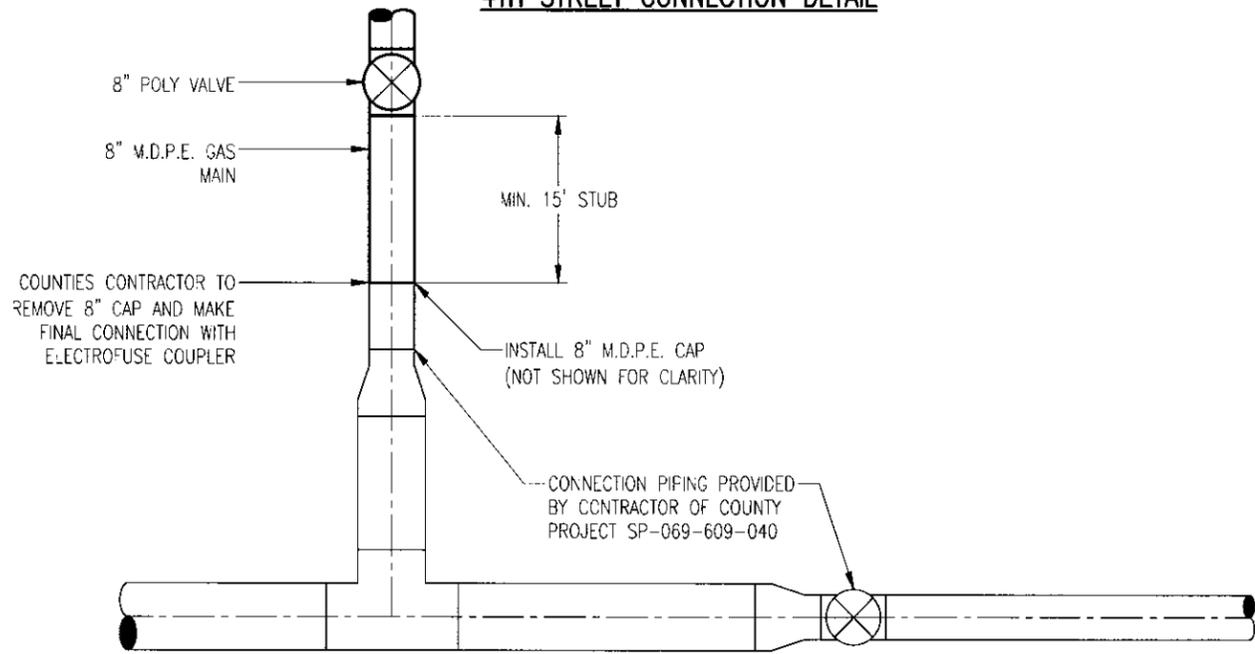


CITY OF DULUTH
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 411 W. 1ST ST. STE. 211
 DULUTH, MN 55802

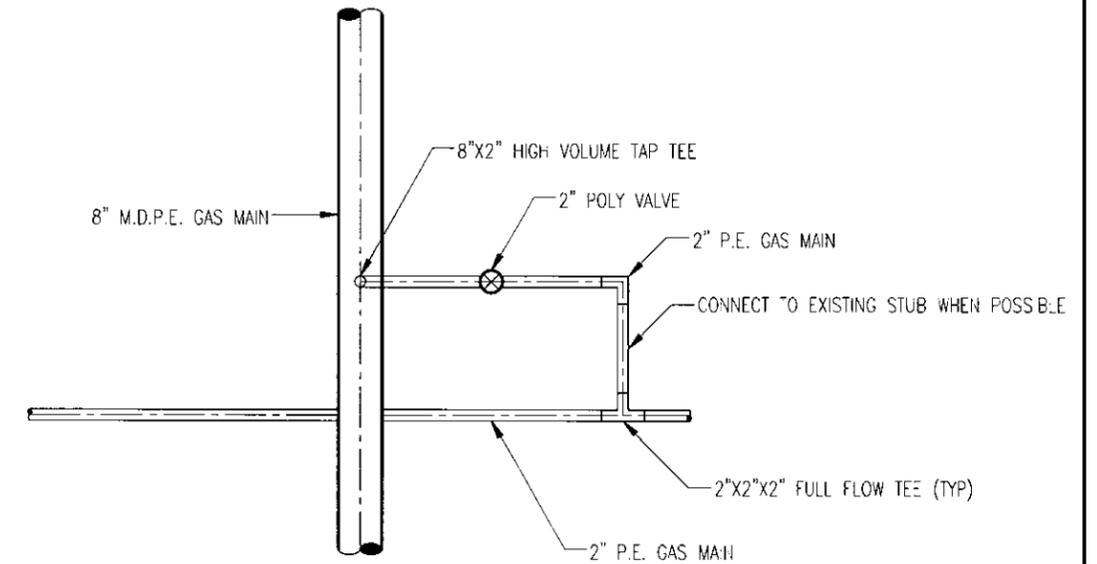
18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.
 CITY PROJECT NO.: 1410
 STATE AID PROJECT NO.:

DRAWN BY: JRL
 PLAN & PROFILE
 SHEET NO. 29 OF 44

4TH STREET CONNECTION DETAIL

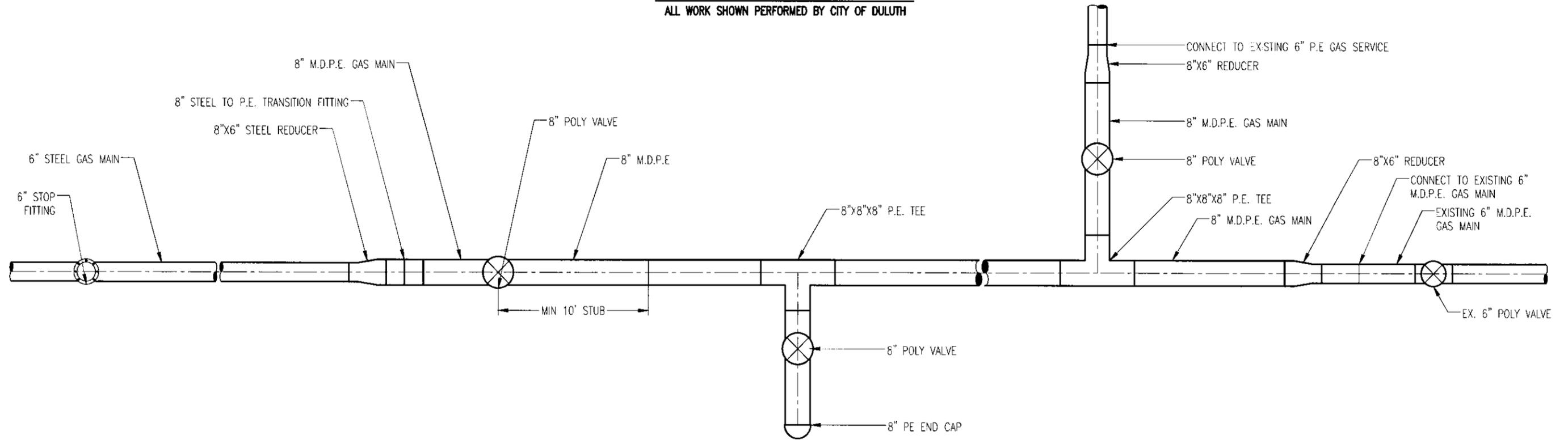


TYPICAL BRANCH MAIN CONNECTION DETAIL



COLLEGE STREET CONNECTION DETAIL

ALL WORK SHOWN PERFORMED BY CITY OF DULUTH



C:\PWU\ENGINEER\PROJECTS\2014\1410_18th_Ave_East_Gas_Main_to_UMD\Drawings\1410-DTL.S.dwg

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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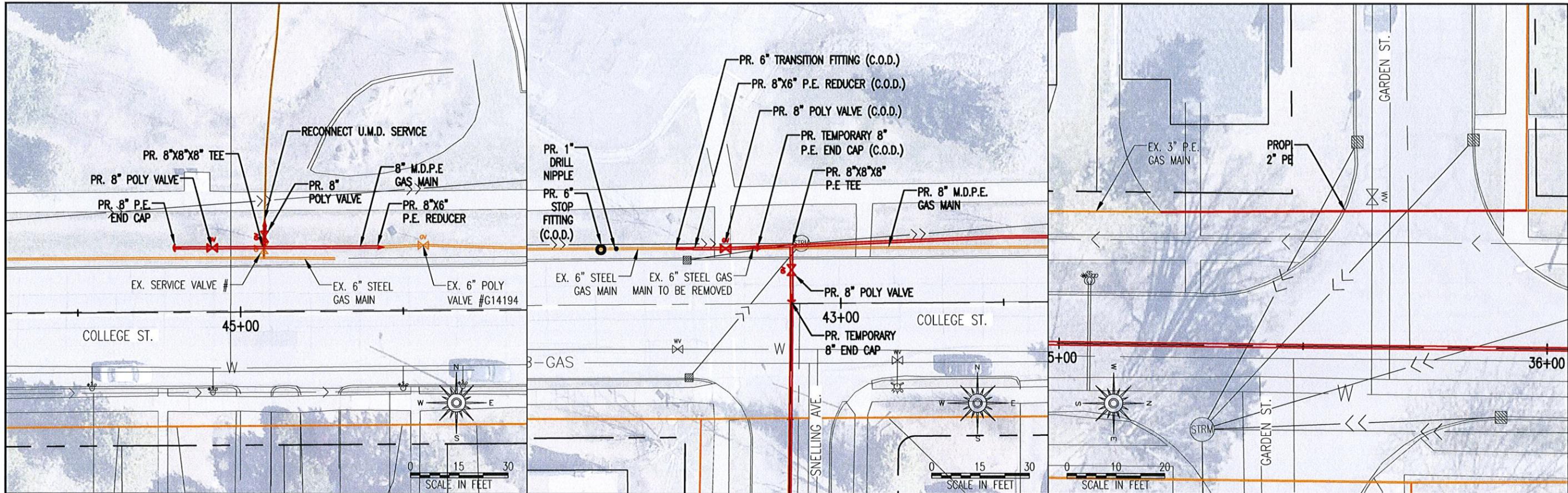
DATE: 05//17/2016
 LIC. NO.: 46875



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

18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.
 CITY PROJECT NO.: 1410 STATE AID PROJECT NO.: ----

DRAWN BY: JRL
 CONNECTION DETAILS
 SHEET NO. 30 OF 44



CONNECTION PROCEDURE 1

CONNECTION PROCEDURE 2

CONNECTION PROCEDURE 3

I:\PW\ENGINEER\PROJECTS\2014\1410_18th_Ave_East_Gas_Main_to_U.M.D.\Drawings\1410-CONX-DTILS-2.dwg

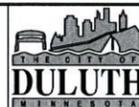
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HOWARD D. SMITH, P.E.
TYPE NAME

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

18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

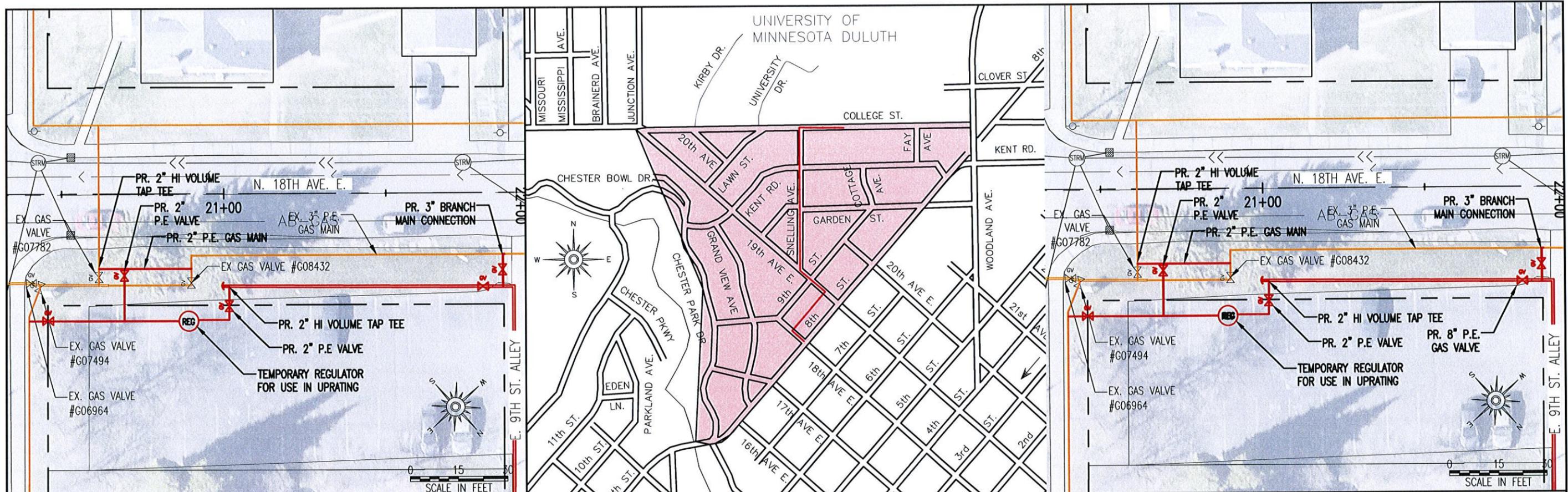
CITY PROJECT NO.: 1410

STATE AID PROJECT NO.: ----

DRAWN BY: JRL

CONNECTION PROCEDURES

SHEET NO. 31 OF 44



CONNECTION PROCEDURE 9

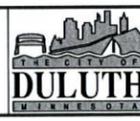
CONNECTION PROCEDURE 10A

CONNECTION PROCEDURE 10B

I:\PWU\ENGINEER\PROJECTS\2014\1410_18th_Ave_East_Gas_Main_to_UMD\Drawings\1410-CONX-DTLS-2.dwg

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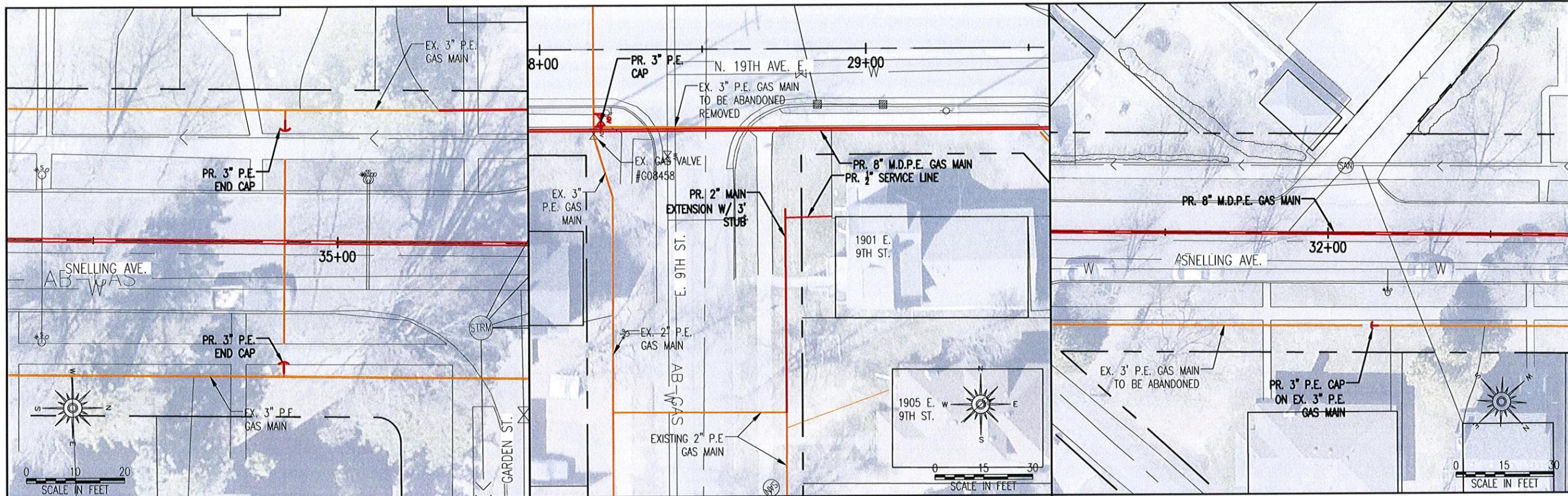
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 LIC. NO.: 46875



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

18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.
 CITY PROJECT NO.: 1410 STATE AID PROJECT NO.: ----

DRAWN BY: JRL
 CONNECTION PROCEDURES
 SHEET NO. 32 OF 44



CONNECTION PROCEDURE 4

CONNECTION PROCEDURE 5

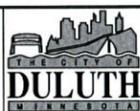
CONNECTION PROCEDURE 6A

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 TYPE NAME

DATE: 05/17/2016
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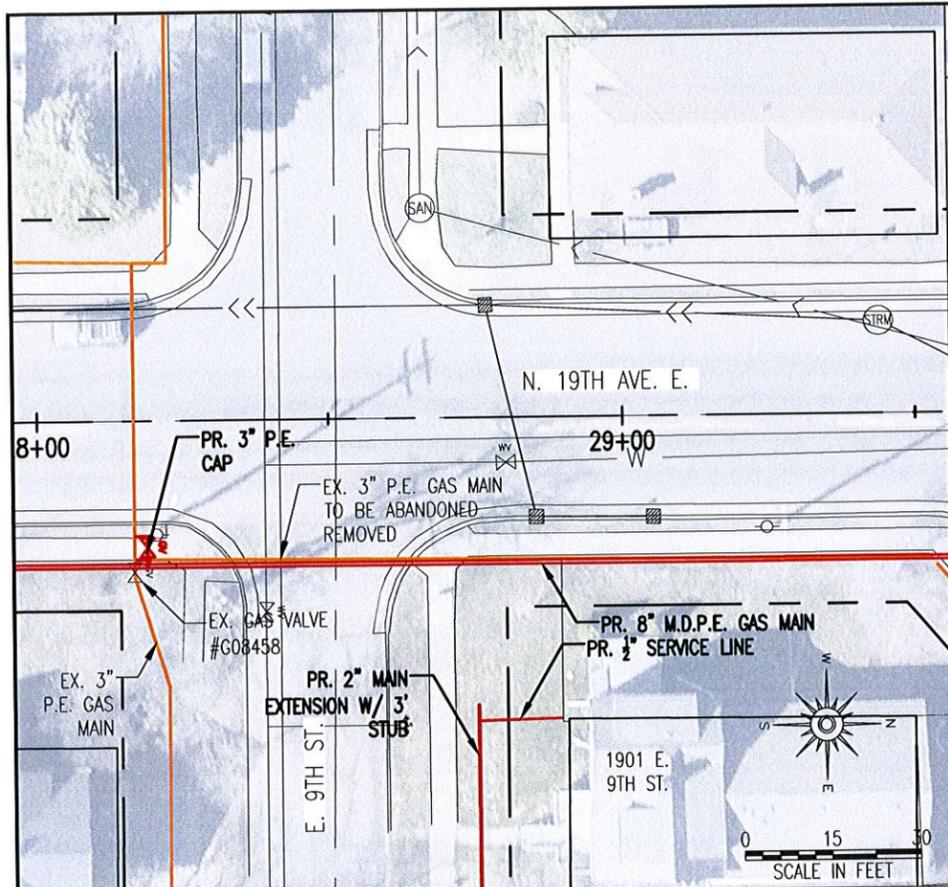
CITY OF DULUTH
 ENGINEERING DIVISION
 411 W. 1ST ST. STE. 211
 DULUTH, MN 55802



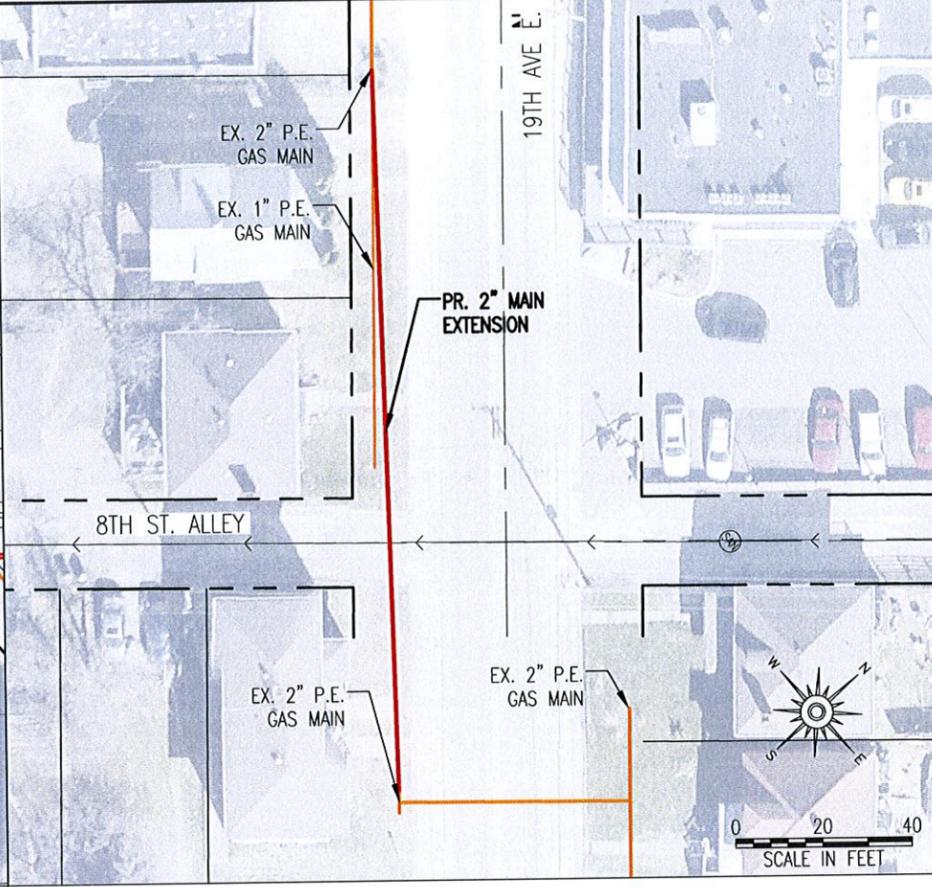
18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.
 CITY PROJECT NO.: 1410
 STATE AID PROJECT NO.: ----

DRAWN BY: JRL
 CONNECTION PROCEDURES
 SHEET NO. 33 OF 44

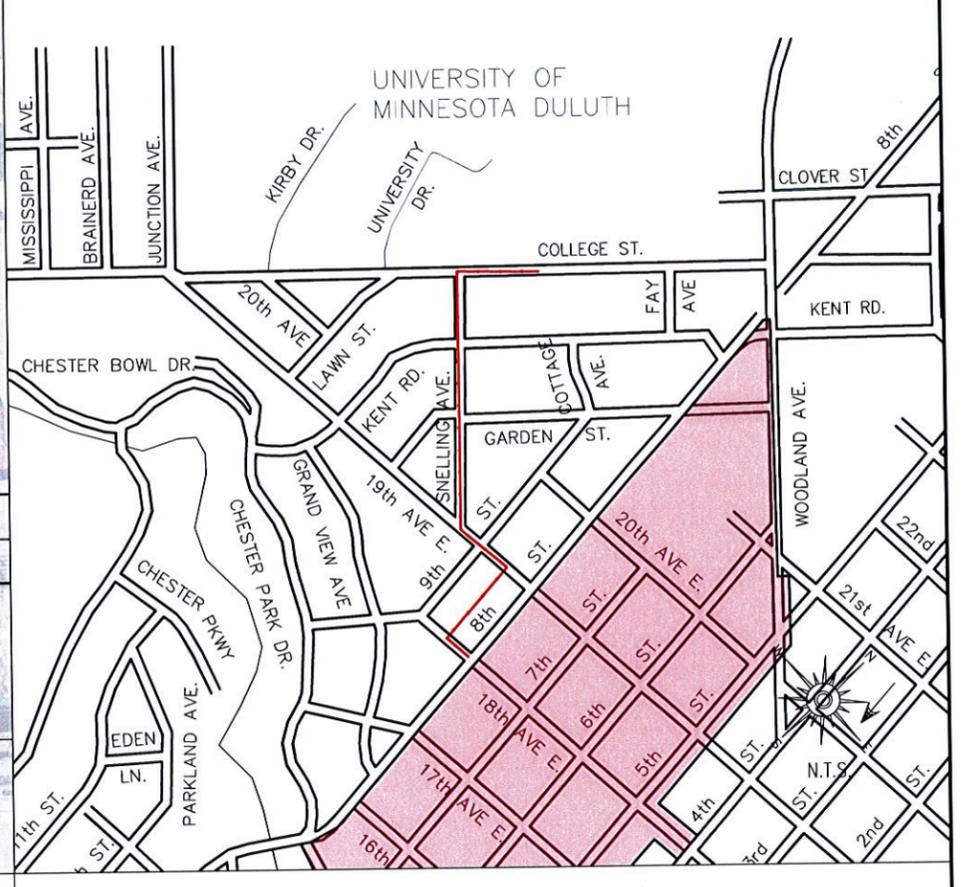
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CONNECTION PROCEDURE 6B



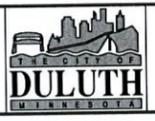
CONNECTION PROCEDURE 7



CONNECTION PROCEDURE 8

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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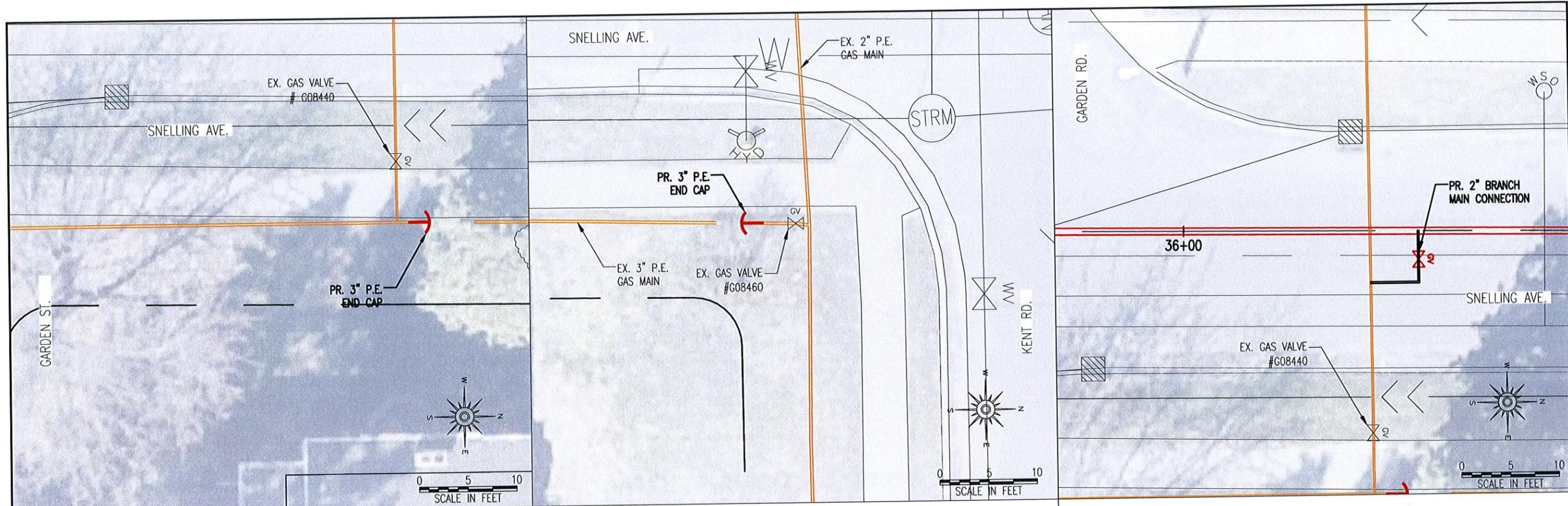
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 LIC. NO: 46875



CITY OF DULUTH
 ENGINEERING DIVISION
 411 W. 1ST ST. STE. 211
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18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.
 CITY PROJECT NO.: 1410
 STATE AID PROJECT NO.: ----

DRAWN BY: JRL
 CONNECTION PROCEDURES
 SHEET NO. 34 OF 44



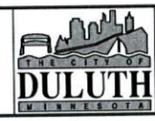
CONNECTION PROCEDURE 17

CONNECTION PROCEDURE 18

I:\PWU\ENGINEER\PROJECTS\2014\1410-18th Ave East Gas Main to UMD\Drawings\1410-CONX-DTLS-2.dwg

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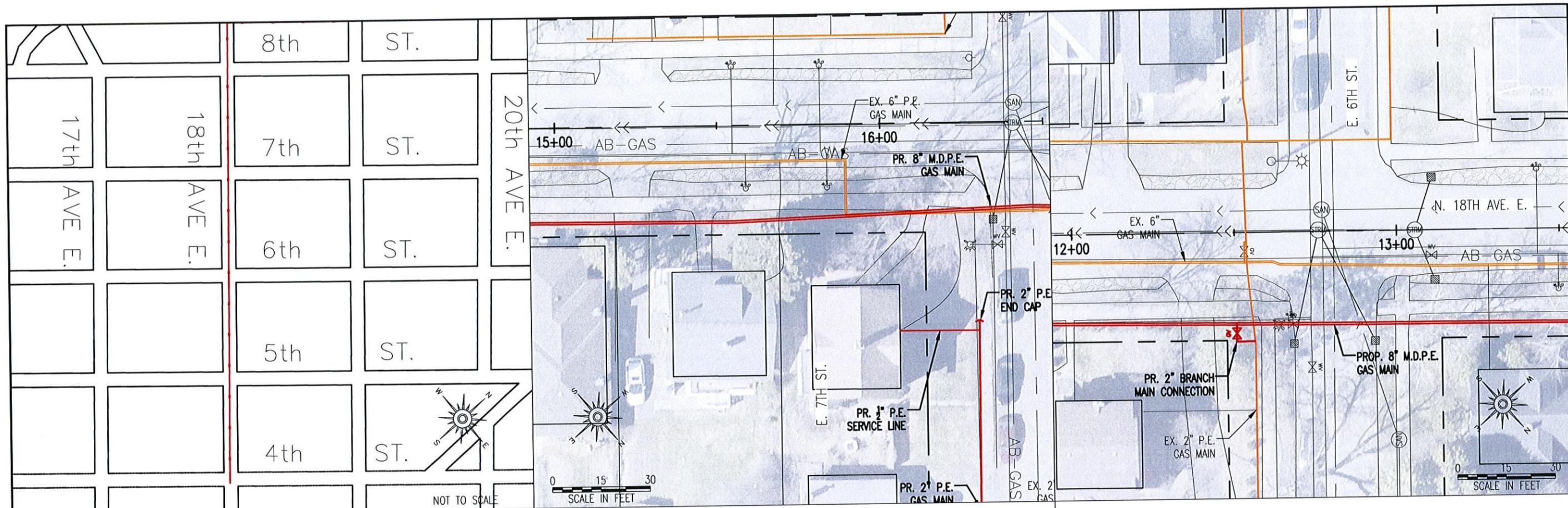
DATE: 05//17/2016
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CITY OF DULUTH
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18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.
 CITY PROJECT NO.: 1410 STATE AID PROJECT NO.: ----

DRAWN BY: JRL
 CONNECTION PROCEDURES
 SHEET NO. 35 OF 44



CONNECTION PROCEDURE 19

CONNECTION PROCEDURE 20

CONNECTION PROCEDURE 21

I:\PWU\ENGINEER\PROJECTS\2014\1410 18th Ave East Gas Main to UMD\Drawings\1410-CONX-DTILS-2.dwg

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HOWARD D. SMITH, P.E.
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DATE: 05//17/2016

LIC. HOWARD D. SMITH, P.E.



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18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

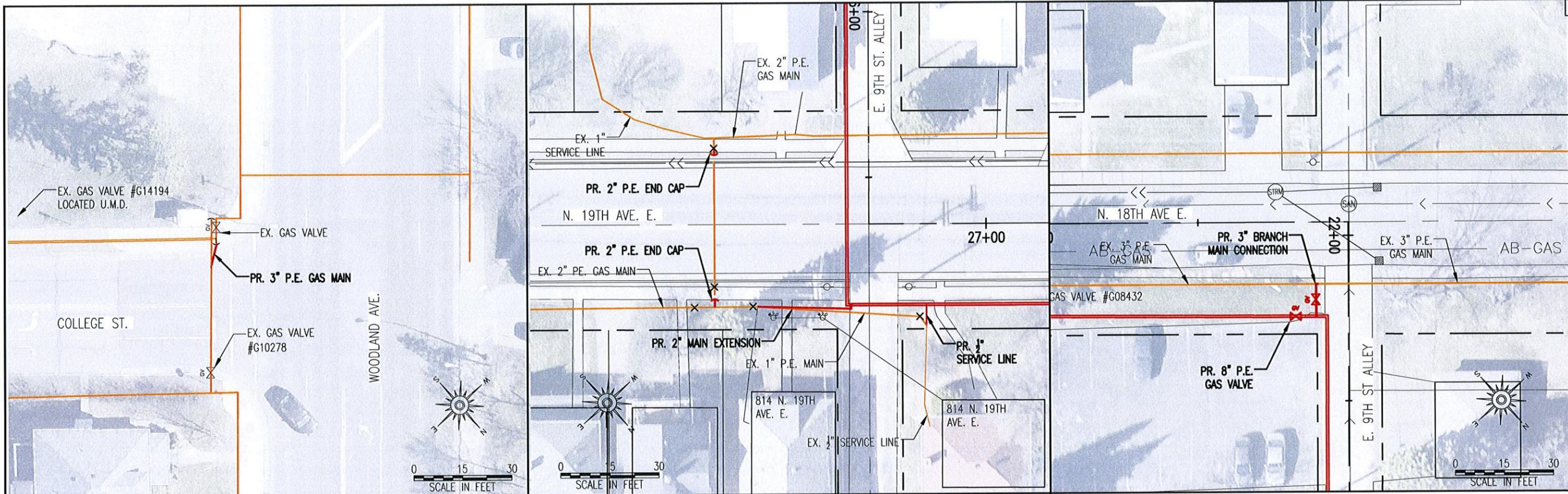
CITY PROJECT NO.: 1410

STATE AID PROJECT NO.: ----

DRAWN BY: JRL

CONNECTION PROCEDURES

SHEET NO. 36 OF 44



CONNECTION PROCEDURE 11

CONNECTION PROCEDURE 12

CONNECTION PROCEDURE 13

I:\PWU\ENGINEER\PROJECTS\2014\1410_18th_Ave_East_Gas_Main_to_UMD\Drawings\1410-CONX-DTLS-2.dwg

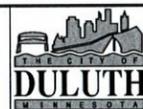
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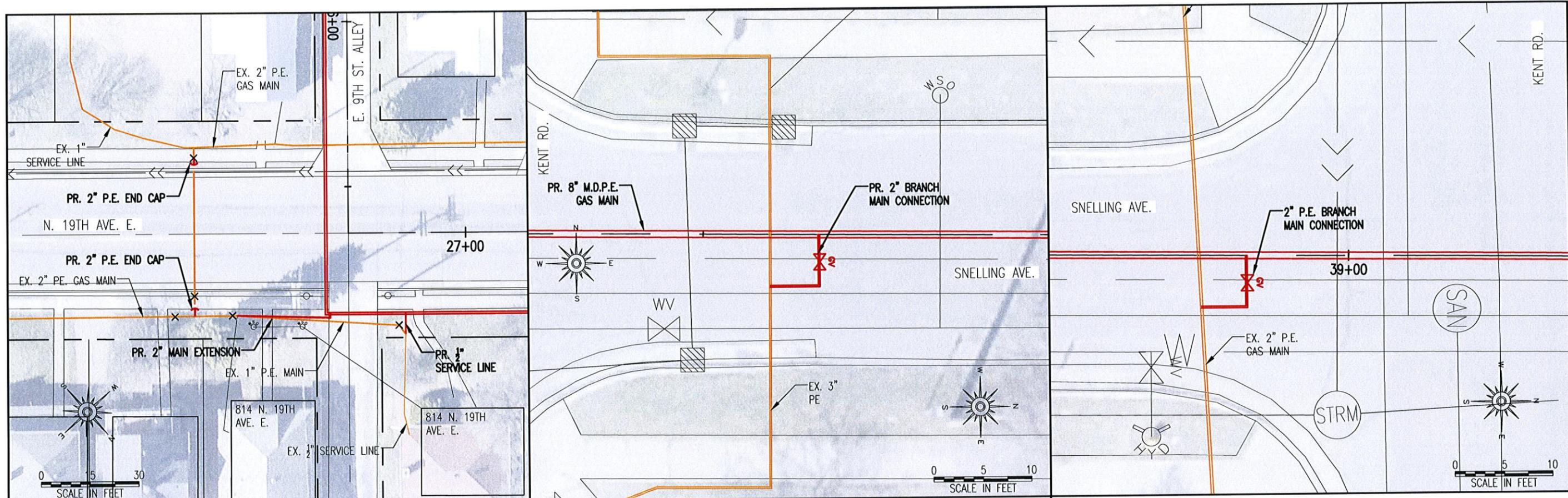
CITY PROJECT NO.: 1410

STATE AID PROJECT NO.: ----

DRAWN BY: JRL

CONNECTION PROCEDURES

SHEET NO. 37 OF 44



CONNECTION PROCEDURE 14

CONNECTION PROCEDURE 15

CONNECTION PROCEDURE 16

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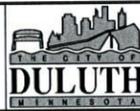
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNATURE: *Howard Smith, P.E.*

HOWARD D. SMITH, P.E.
TYPE NAME

DATE: 05/17/2016

LIC. NO.: 46875



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

18TH AVE. E. & SNELLING AVE. GAS MAIN TO U.M.D.

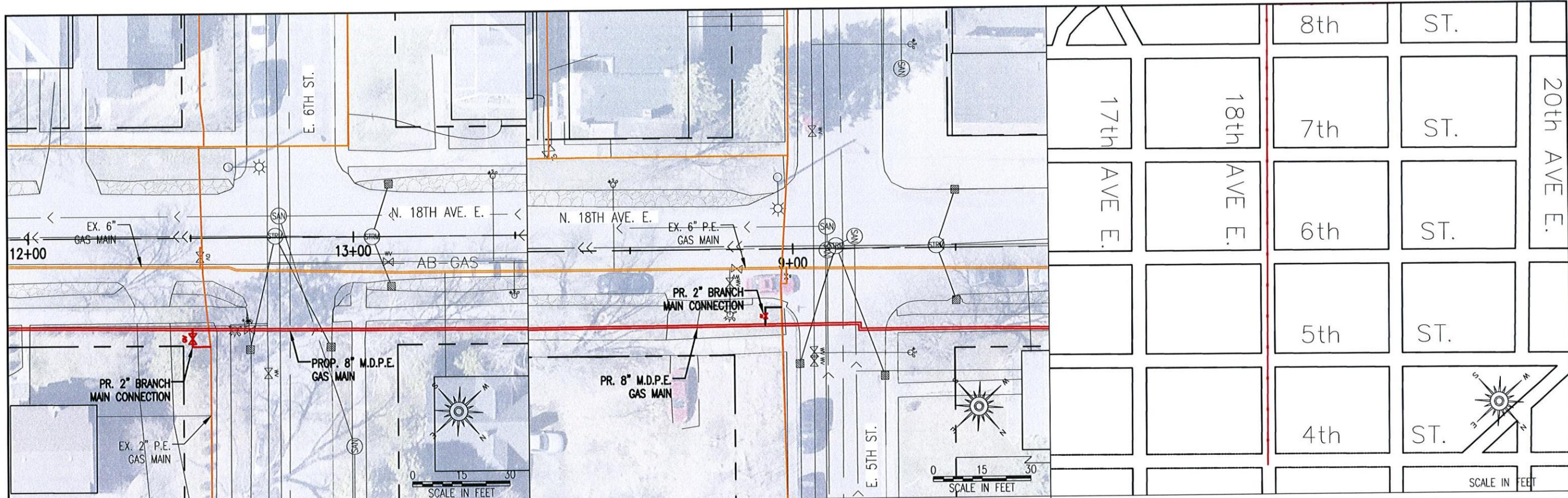
CITY PROJECT NO.: 1410

STATE AID PROJECT NO.: ----

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CONNECTION PROCEDURES

SHEET NO. 38 OF 44



CONNECTION PROCEDURE 22

CONNECTION PROCEDURE 23

CONNECTION PROCEDURE 24

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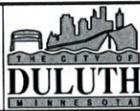
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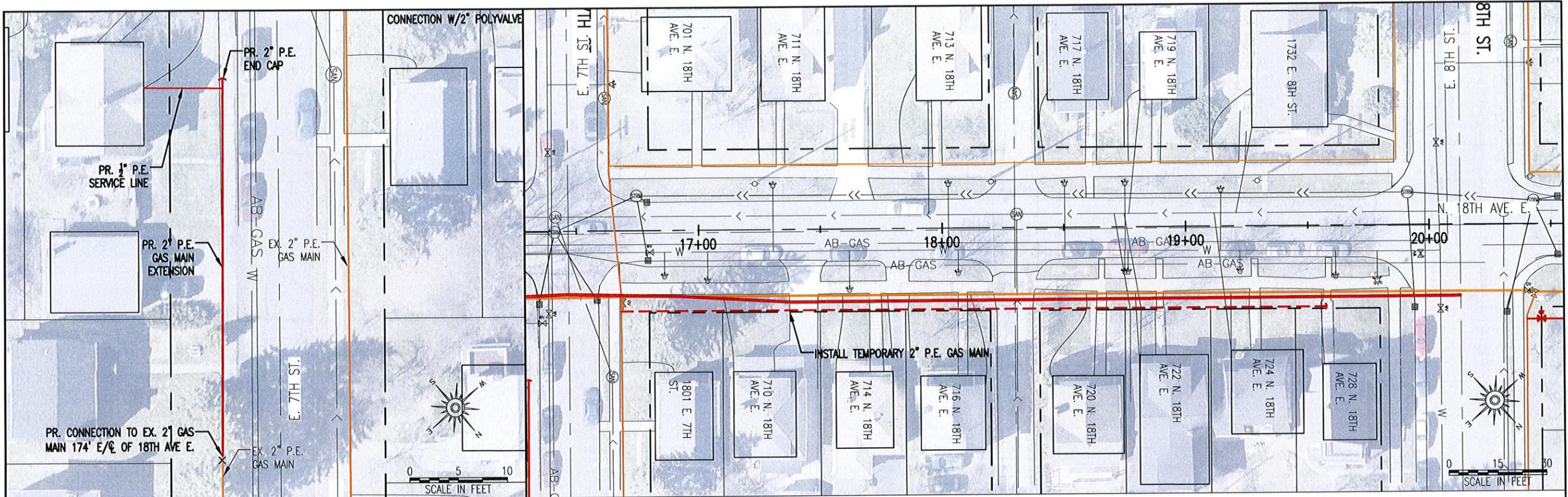
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CONNECTION PROCEDURES

SHEET NO. 39 OF 44



CONNECTION PROCEDURE 25

CONNECTION PROCEDURE 26

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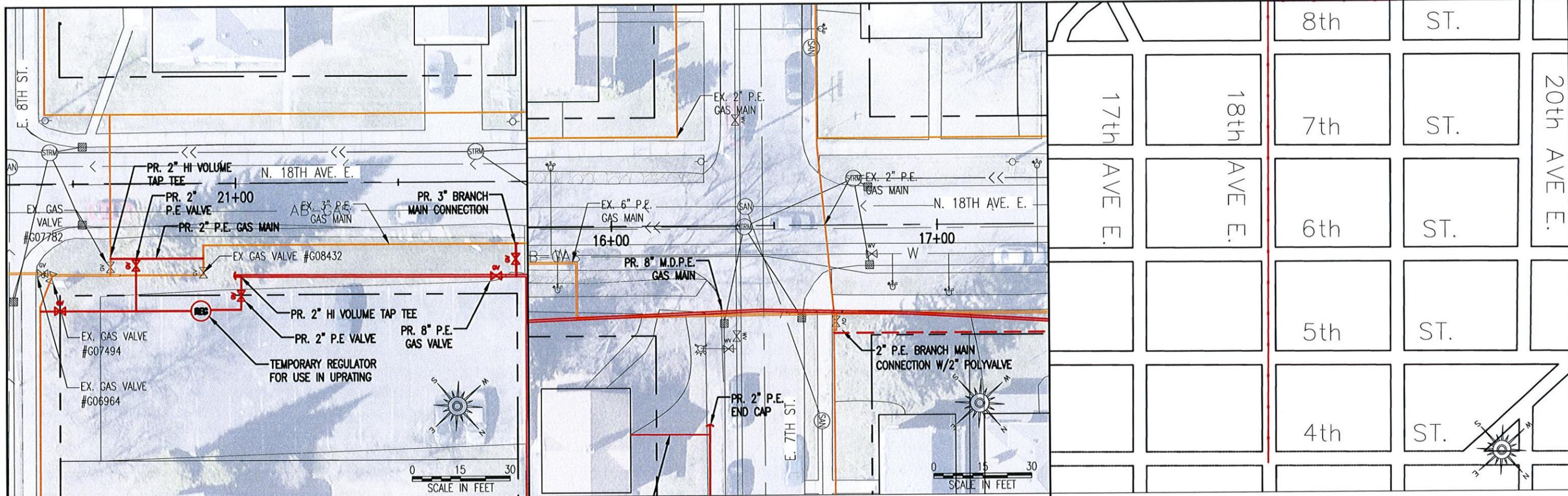
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 CONNECTION PROCEDURES
 SHEET NO. 40 OF 44



CONNECTION PROCEDURE 27

CONNECTION PROCEDURE 28

CONNECTION PROCEDURE 29

SCALE IN FEET

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LIC. HOWARD D. SMITH, P.E.



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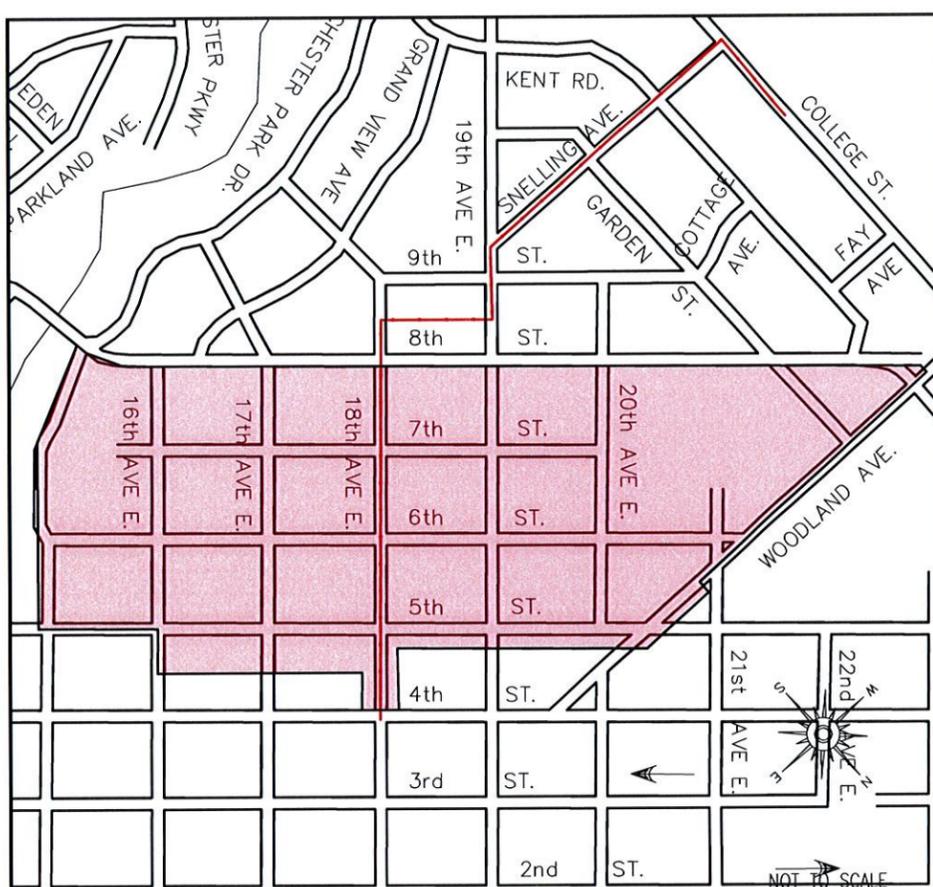
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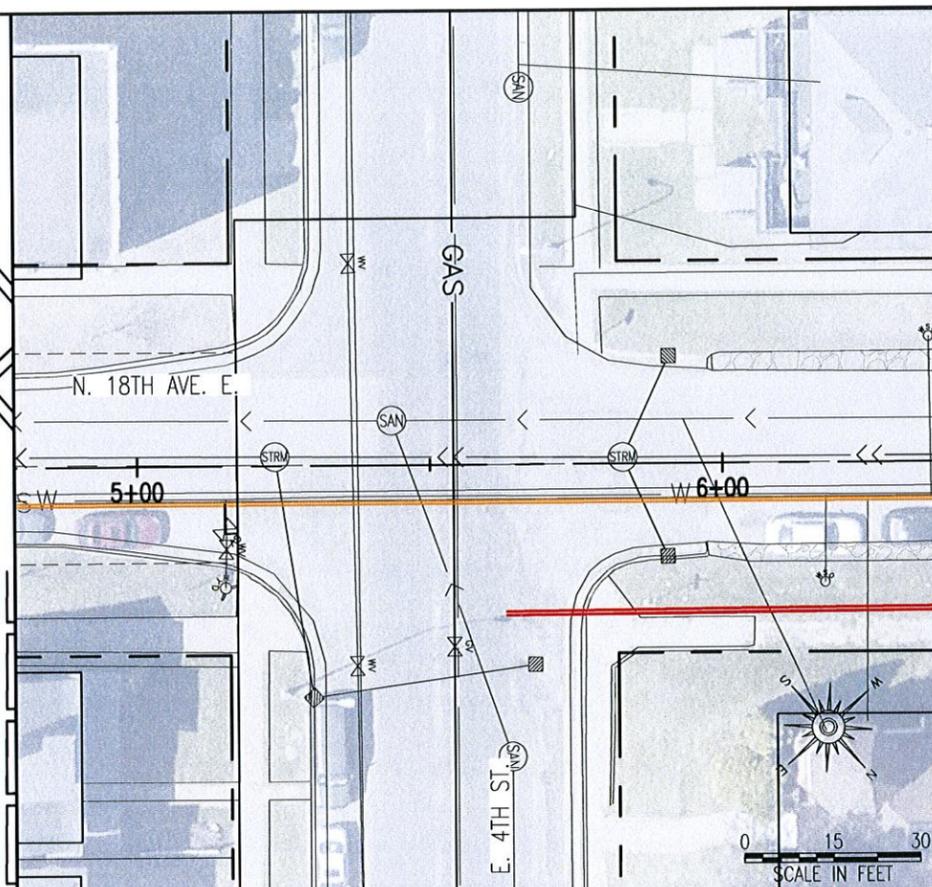
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CONNECTION PROCEDURES

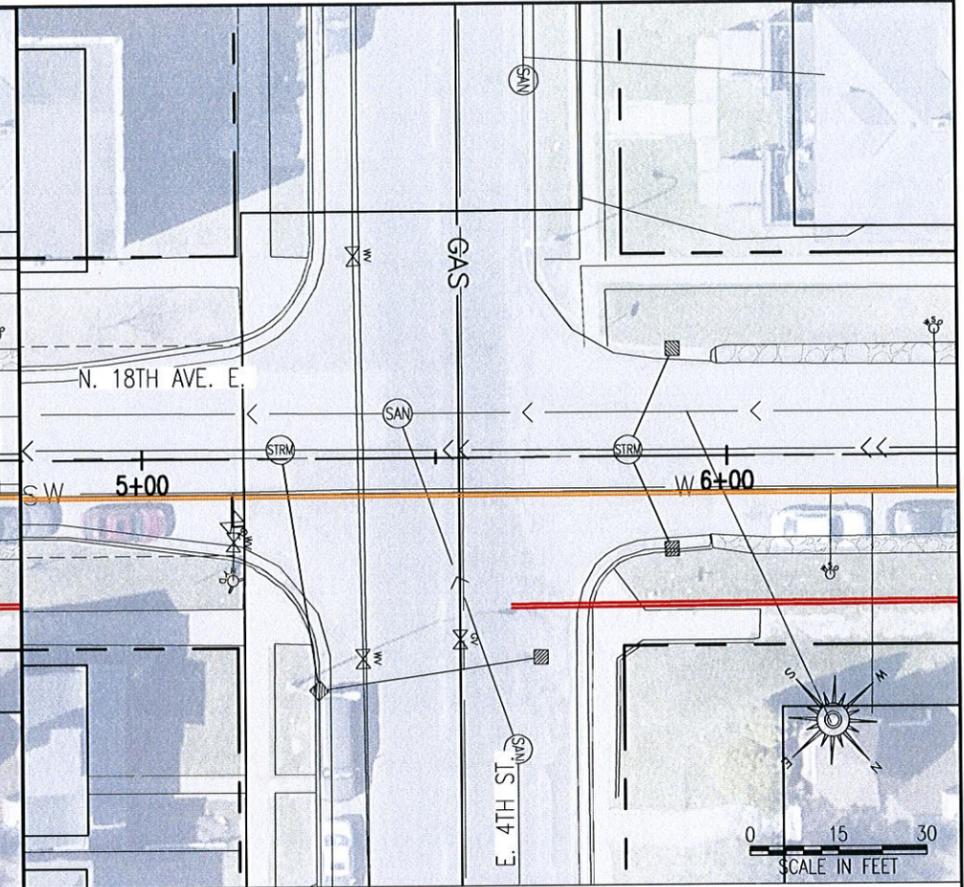
SHEET NO. 41 OF 44



CONNECTION PROCEDURE 30



CONNECTION PROCEDURE 31



CONNECTION PROCEDURE 32

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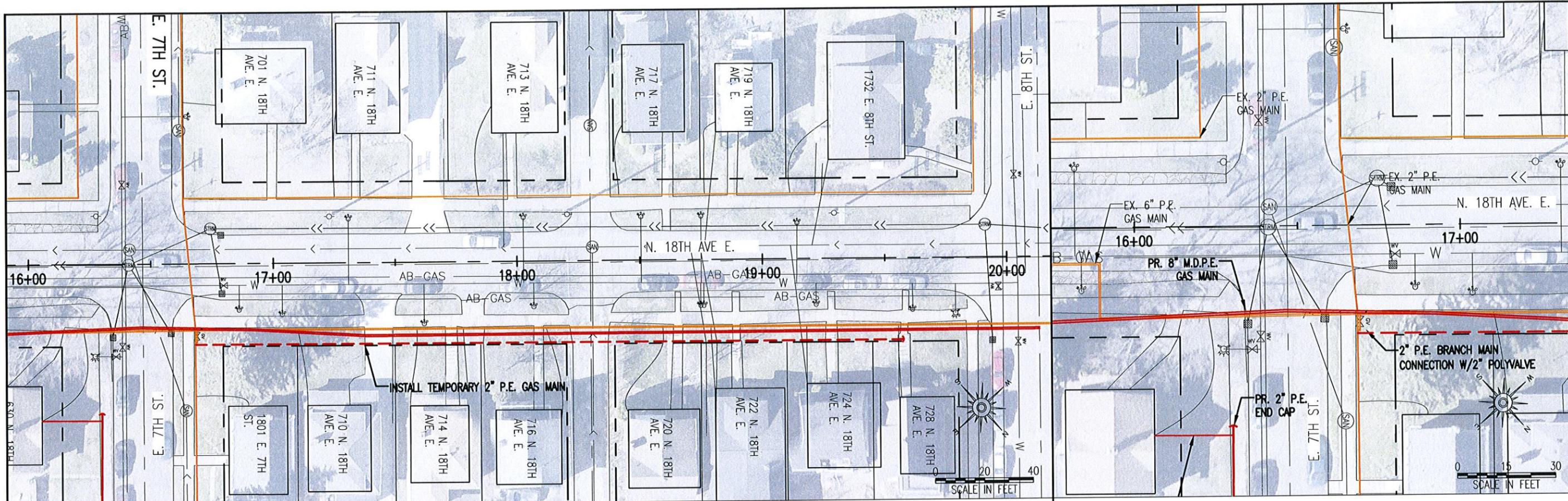
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 CONNECTION PROCEDURES
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CONNECTION PROCEDURE 33

CONNECTION PROCEDURE 34

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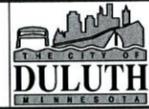
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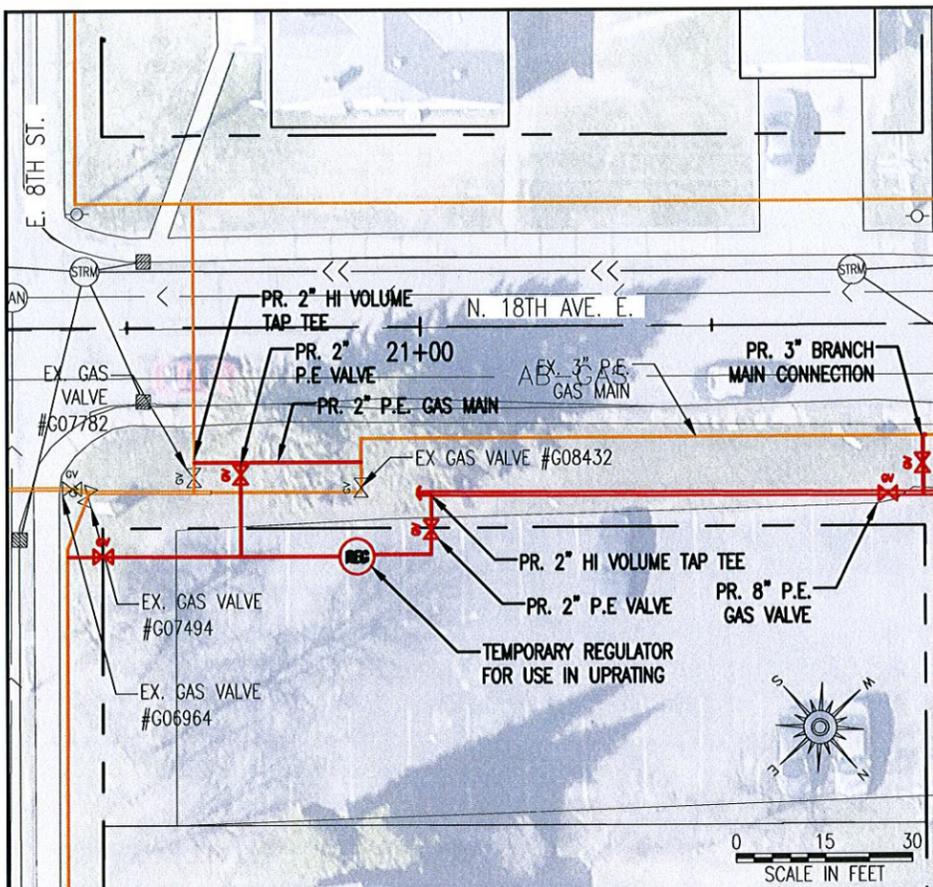
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STATE AID PROJECT NO.: ----

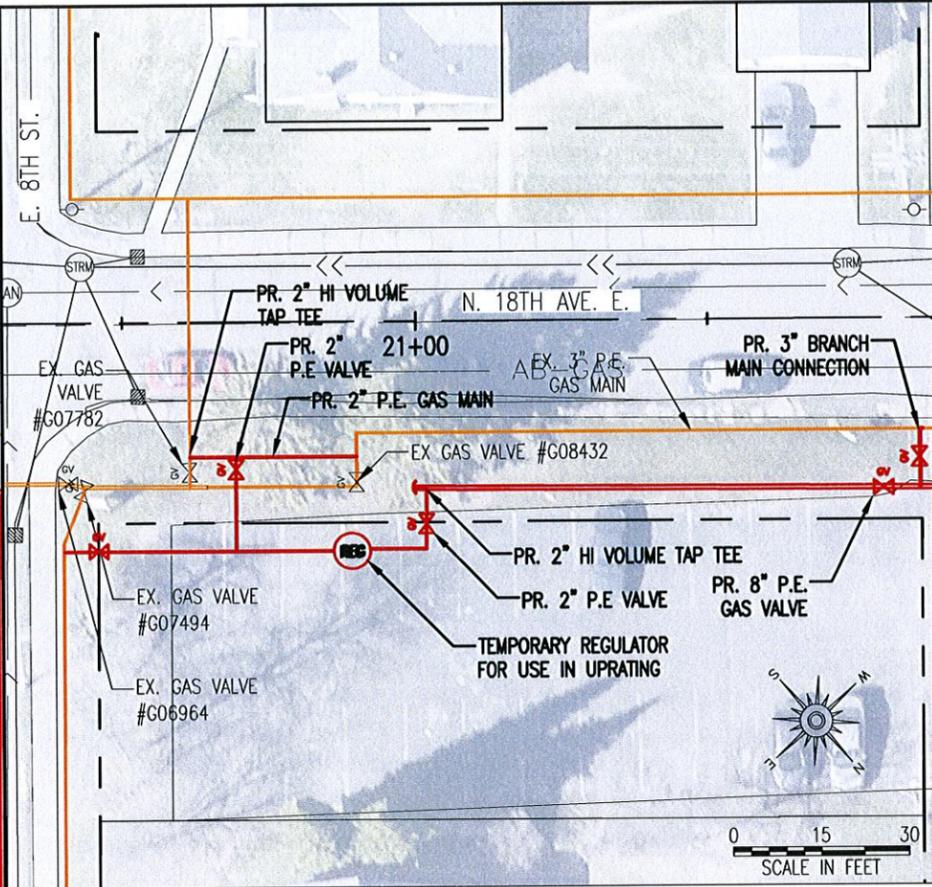
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CONNECTION PROCEDURES

SHEET NO. 43 OF 44



CONNECTION PROCEDURE 35



CONNECTION PROCEDURE 36

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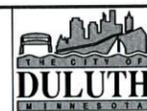
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